

# RUTHIN CASTLE NORTH WALES

A CLINIC OF PRIVATE HOSPITAL for INTERNAL DISEASES

Except Mental or Infectious Diseases

The Clinic is equipped for the investigation and treatment of HEART and ARTERIAL DISEASE, ANEMIAS, NER-VOUS DISEASES, DISORDERS of THE STOMACH and INTESTINES, DIABETES, MEPHRITIS, MALNUTRITION, OBESITY, TROPICAL DISEASES

and other complaints which need rest, skilled observation, chemical, bacteriological and protozoological investigation, and dietetic, physical, or other special treatment, or daily supervision. The Castle is fitted with Laboratories, X-ray Department, Electrocardiograph, Medical Baths, and Lifts.

The wholetime Staff include Physicians who have had special experience of Clinical Medicine, Pathology, Diabetes, and X-ray work; also Analytical Chemists, Bacteriologists, Radiographers, a Matron, trained Nurses, Dietusts, Masseurs and Masseuses. Surgeons, Gynacologists and Specialists for Diseases of the Eyes, Nose and Throat visit the Clinic when desired. The climate is mild and the neighbourhood beautiful.

The weekly fees are from 15 guineas a week, according to the room; rooms with bathroom are from 21 guineas. The charges include doctoring, nursing, board and lodging, all chemical, bacteriological, X-ray, or other examinations advised, and all the usual forms of treatment. There are no extra charges except for alcohol (when ordered) and laundry. An examination and consultation fee of 15 guineas is charged on the first visit

SPECIAL FEE FOR INVESTIGATION ONLY, 30 GUINEAS, including stay up to 10 days and report to doctor.

# For MEDICAL RADIOGRAPHY —full-scale or miniature

Full-scale radiography and miniature radiography are both vital instruments in medical diagnosis, and for both techniques Kodak provides photographic materials and other requisites of proved efficiency

#### For full-scale radiography

- 'KODAK' BLUE-BRAND ULTRA-SPEED X-RAY FILM
  - the master X-ray film, supreme in speed and diagnostic quality
- 'KODAK' D.196 X-RAY DEVELOPER POWDER-

the X-ray developer, with replenisher, giving exceedingly long working life with constant development time throughout.

- 'KODAK' ULTRA-RAPID X-RAY DEVELOPER POWDER
  - which, with 'Kodak' Ultra Rapid Fixing Salt, permits the inspection of radiographs in the surgical theatre within 60 seconds
- X-RAY PROCESSING UNITS AND DRYING CUPBOARDS the most up-to-date equipment for X-ray processing.
- Other supplies include X-ray cassettes and intensifying screens, wet-film carrier and X-ray illuminators.

#### For miniature radiography

- 'KODAK' FLUOROGRAPHIC UNIT
  - an assembly comprising gantry, tunnel, fluorescent screen and camera unit, together with a flexible coupling giving automatic adjustment for height with the X-ray tube.
- 'FLURODAK' FILM-

created specifically for fluorography. Available as 35 mm. film in 36-exposure cassettes or m 21 ft., 25 metre or 100 ft. lengths. and as 16 mm. film in 50 ft. spools.

'KODAK' FLUOROGRAPHIC FILM VIEWER-

for examining miniature radiographs by direct magnification.

Other supplies include chest callipers, 35mm. film spiral processing units, pipedged aprons, adjustable processing frames, negative marker outfits and safelights.

KODAK LTD., (X-ray Sales) KINGSWAY, LONDON, W.C.2

# The solving of an ORTHOPAEDIC PROBLEM . . . .



Better functional result and a greatly improved appearance are the main advantages to be gained by the patient who undergoes amputation of deformed feet in order to be fitted with artificial legs. Such cases require very careful thought by both the surgeon and the limb maker as there are many points of importance to both of them to be considered before a decision can be given. Such cases vary a great deal and the limb maker's responsibility is a grave one as it is he who must produce the final result. The case illustrated is a good example of the highly successful result which can be obtained by such close co-operation.

### D E S O U T T E R

for the design and construction of light metal artificial limbs

-DESOUTTER BROS. LTD. -

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The top illustration shows clearly the position of the feet which caused an ungainly walking action. The two lower illustrations show the greatly improved appearance. The fitting of artificial lags also gave a

A very complete survey of the extent to which Desoutter Light Metal Artificial Limbs can restore business, social and necreational activity is made by Mr F. R. Descenter in a new polume called "Back to Activity." A copy will gladly be sent on request



# ILFORD X-RAY FILMS

### for accurate diagnosis

liford X-ray films have achieved a world-wide reputation because they consistently conform to the very high standard of quality required for diagnostic purposes.

There are three liford films for medical purposes—STANDARD, RED SEAL, and ILFEX—each having its own special characteristics and being pre-eminently suitable for the particular work it has to do.

Brief details of these films are given below and radiologists are invited to obtain further particulars from liford Limited.

- ILFORD STANDARD X-RAY FILM is the general purpose X-ray film, being highly sensitive to the finorescence of salt screens as well as to X-rays it gives the highest possible contrast when used with screens
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- ILFORD 1LFEX X-RAY FILM is a non-screen film for use where the resolution of fine detail is required even at the cost of greater exposure, e.g. as in the radiography of extremitles

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### NEW CHEMOTHERAPEUTICS

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A new, non-toxic, non-irritating, water-soluble chemical Bacteriostatic to proteus, pyocyaneus and other organisms, hastens healing, promotes granulation and does not produce drug resistance.

#### **HEXA-MANDELATE**

For the treatment of  $\beta$  Coll infections. Active in all the urinary pH ranges without the addition of Ammonium Chloride or a Ketogenic diet.

#### **ESÕTONE**

Nervine and sedative. A palatable tonic combining the properties of Bromide, Vitamin B<sub>1</sub> and Valerian in which the odour has been effectively masked

Developed by the makers of

## **ESőBAN**

the unsaturated fatty acid treatment for skin diseases.

#### ESTBAN OINTMENT

for the treatment of skin diseases. A readily absorbed ointment which also forms an ideal base, being compatible with the medicaments used in Dermatology

#### ESTBAN EMULSION

for oral administration and as a supplement to the ointment in chronic or intractable cases.

#### ESTBAN CAPSULES

presenting the unsaturated fatty acids in a convenient form and as an alternative to the Emulsion.

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Vim Stainless Steel Hypodermic Needles do not rust or clog. Razor-sharp edges. Highly economical. Sample needle gladly sent on request.

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Advantages include: special 'heat-resistant', 'slow-ground' glass; individually mated glass plungers working in individually calibrated barrels; superb craftsmanship. Prompt repair service. Sizes 1 c.c. to 20 c.c. Limited supplies. Enquiries welcomed



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VIII



## "Double protection"

The wounds, sores and abrasions of children require double protection for the doctor has to contend with the difficulty of preventing children from scratching and the tendency such lesions have to become infected.

This double protection is achieved by

SULPHANILAMIDE TULLE (OFFREX BRAND) in the first place this dressing shields the lesions from external interference whilst allowing free drainage; through its wide gauze mesh. It is impervious to organisms and adheres readily without pulling.

In the second place SULPHANILAMIDE TULLE is impregnated with an emulsion containing 10% sulphanilamide. It is thus bacteriostatic and helps to prevent the complications of infection.

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The gauge of 2 m.m. mesh allows for adequate drainage Packed in continuous sirty, 3 yes. x 34 ins.

Subject to the regulations applying to Schedule 4 of the Poisons Act

Owing to heavy demands, please order order to meet immediate needs.

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A striking advance in intranasal sulphonamide therapy



suspension of microcrystalline ('Mickraform') sulphathiazole, 5 per cent, in an isotonic solution of p-hydroxy-α-methylphenylethylamine hydrobromide ('Paredrinex'), 1 per cent 'Sulfex' combines, for the first time, in a single chemically stable suspension, the potent bacteriostatic action of sulphathiazole and the effective vasoconstriction of 'Paredrinex' The crystals of 'Mickraform' sulphathiazole—many hundred times smaller in mass than the ordinary commercial crystals—are not quickly washed away from infected areas, but remain in situ as a fine, even frosting which exerts sustained bacteriostasis The rapid, prolonged, and complete shrinkage action of 'Paredrinex' renders the infected areas readily accessible to the sulphathiazole and achieves maximum ventilation and drainage Indicated in nasal and sinus infections, particularly those secondary to the common cold, and in pharyngolaryngeal sore throat

# 'SULFEX'

THE UNIQUE SULPHONAMIDE VASOCONSTRICTOR COMBINATION

Available, on prescription only, in 1-oz. bottles with dropper

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IN simple depression 'Benzedtine' Tablets may benefit the patient by breaking down pathologically organized habit-patterns and by restoring the patient's 'energy feeling'

The following instances of simple depression are familiar to every physician and all of them may be improved by 'Benzedrine' therapy. (1) Depression following acute infectious disease, typically influenza, (2) Depression subsequent to surgical operations, (3) Depression following pregnancy and childbirth; (4) Depression accompanying the onset and course of the menopause in women and the involution period in men, (5) Depression associated with menstrual dysfunction; (6) Reactive depression precipitated by an external problem situation which the patient cannot resolve, tolerate, or ignore

# BENZEDRINE' TABLETS

Issued in bottles of 50 grooved tablets, each containing 5 mg β-aminopropylbenzene sulphate (amphetamine sulphate)



MENLEY & JAMES LIMITED

BENZEDRINE

A volatile vasoconstrictor giving prompt relief in nasal congestion

POR the treatment of head colds, sinusitis, vasomotor rhinitis, nasal catarrh, hay fever, and asthma, 'Benzedrine' Inhaler, the original volatile vasoconstrictor, has been accorded an enthusiastic medical backing for many years. Used at the first sign of a cold, it will often abort the condition entirely. In the acute stages it affords marked symptomatic relief and helps to prevent the onset of serious complications.

'Benzedrine' Inhaler is rapid in action, lasting in effect, simple to apply, and may be used with confidence in the nasal congestions of children Its vapour diffuses throughout the entire nasal cavity, relieving congestion in areas that are usually inaccessible to liquid inhalants

# BENZEDRINE' INHALER

Each Inhaler contains  $\beta$ -aminopropylbenzene (amphetamine) 0.325 gm, oil of lavender 0.097 gm, and menthol 0.032 gm

123 COLDHARBOUR LANE, LONDON, SE5



Provides complete replacement therapy in menopausal disorders



HIS unique combination of stilbestiol and calcium phosphate is specially designed for the oral treatment of menopausal disorders The stilbæstrol content facilitates graduation of dosage and promotes a smooth adjustment to the new endocrine level. The calcium content has a two-fold importance (1) It guards against the deficiency of this element associated with the climacteric, (2) It reduces to a minimum or entirely eliminates—the nausea and vomiting that often result from treatment with stilborstrol by itself This combination makes possible the bringing of physical and mental menopausal symptoms under complete control Ovendosyn' is also of proved value in other forms of ovarian insufficiency —amenorrhœa, dysmenorrhæa,

# OVENDOSYN' TABLETS

Issued for prescription in bottles of 50 tablets, each containing stilbæstrol 0.5 mg. and calcium phosphate 200 mg



MENLEY & JAMES LIMITED



Æstrogenic treatment of carcinoma of prostate and breast

> THE value of stilbostrol in the control of prostatic caicinoma has already been proved clinically, and its use may bring about relief of pain, general physical improvement, regression of metastases, and reduction in the size of the tumour The potentialities of estrogenic treatment in advanced breast cancer are now being explored, and the most marked results, so far, appear to be in women of post-menopausal age Since relatively large doses of stilbæstrol may be required for treating these two malignant conditions, 'Ovendosyn' Forte has been made available It is a particularly well tolerated presentation of stilbæstrol, the calcium content minimizes side-effects and serves to accelerate the regression of secondary cancerous deposits in bone

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Issued for prescription in bottles of 50 tablets, each containing stilbæstrol 50 mg and culcium phosphate 325 mg

123 COLDHARBOUR LANE, LONDON, SE5



The reconstructive tonic with a world-wide reputation



POR shortening and brightening the trying period of convalescence following illness, operation, or parturition, Neuro Phosphates (Eskay Brand) stands supreme. It is of exceptional value in the treatment of nervous strain, exhaustion, and anxiety occasioned by prolonged stress. As a reconstructive tonic in impaired vitality and general debility it is unrivalled in its rapidity of action and unfailing efficiency.

Neuro Phosphates is light, readily assimilable, easily tolerated, and so agreeable to the taste that, as clinical experience proves, the most difficult patient does not tire of it even with continued use.

## NEURO PHOSPHATES

Each adult dose (two teaspoonfuls) contains in and state Sodium Glycerophosphate 2 grs, Calcium Glycerophosphate 2 grs, Strychnine Glycerophosphate 1 64 gr.

Issued for prescription in 8-0 bottles



MENLEY & JAMES LIMITED



For arthritis and rheumatoid conditions generally

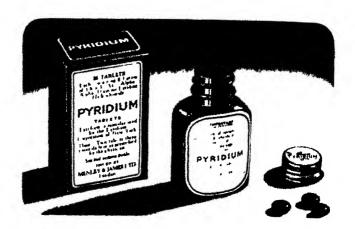
N general practice 'Calsiod' finds its widest use in two types of condition (1) Mild arthritis where there is considerable discomfort but only slight joint involvement, (2) Vague rheumatic pains (lumbago, fibrositis, neuralgia, etc), characterized by inflammation and swelling, where the obscure etiology makes satisfactory treatment difficult Even in severe cases of acute or chronic arthritis brilliant results have been obtained with 'Calsiod,' especially when the drug is administered over a reasonably prolonged period 'Calsiod' is far more than a palliative, for by its use patients who have been chronic invalids for many months can often be restored to useful activity.

# 'CALSIOD' TABLETS

Issued for prescription in bottles of 30 tablets, each containing 0.5 gm (7.7 grs) calcium ortho-iodoxybenzoate

123 COLDHARBOUR LANE, LONDON, S E 5





A safe and reliable enito-urinary antiseptic

PYRIDIUM in tablet form has an outstanding record in the successful treatment of genito-urinary infections. It gives prompt relief of such distressing symptoms as frequency, urgency, tenesmus, and permeal irritability, and clinical experience proves that this relief is a fitting prelude to satisfactory end results in cystitis, pyelitis of premancy, pyelonephritis, prostatitis, prostatic hypertrophy, vaginitis and urethritis.

Pyridium has a local analgesic effect upon the genito urinary mucosa, it has minimal toxicity, and is non-narcotic, it is non-irritative in therapeutic dosage, and there is a striking absence of genito urinary irritation even in the presence of hyperacute symptoms. It is equally effective in acid or alkaline urine, and its administration does not call for any special dietary regime

### PYRIDIUM

Pyridium is the mono-hydrochloride of the azo dve of the pyridine series phenyl-azo-alpha-alpha-diamino-pyridine

Issued in tibes of 12 and in bottles of 25 tablets



MENLEY & JAMES LIMITED



Antiseptic bland resolvent iodine ointment

> virtues of iodine—its unequalled **HE** inflammation-reducing, antiseptic. properties -have long resolvent established beyond dispute. It is peculiarly true of rodine, however, that its measure of suitability, full potentialities, and range of indications, depend entirely upon the manner of its presentation In Iodex, iodine is presented in a bland yet potent form. Unlike ordinary presentations of iodine, Iodex can be applied, without risk of irritation. even to mucous surfaces. Its chief indications include swollen glands, simple goitre, enlarged prostate, hæmorrhoids, pruritus ani, open wounds, ringworm, sycosis, dry eczemas, joint, muscle and nerve pains, and external inflammations generally

> Where superior analgesic action is desirable, and perfect blandness is not essential, Iodex cum Methyl Salicyl (5%) may be preferably employed



N B If bandages are employed over either form of Iodex ointment they should be light and loose, not tight or air-excluding Issued in 1-oz and 4-oz pots

123 COLDHARBOUR LANE, LONDON, S.E 5





The best chance in the treatment of agranulocytic angina

F a sore throat resists topical treatment for 48 hours or more, or if there are symptoms of high fever, malaise, ulceration of the mucous membranes, chills, headache or vomiting, the possibility of agranulocytosis cannot be excluded an immediate blood examination In agranulocytosis, 'Pentnucleotide' been recognized as a most hopeful form of therapy; but the importance of early treatment and adequate dosage (10 cc four times daily for at least four days) cannot be over-emphasized "At present it would appear that 'Pentnucleotide' in doses of at least 40 c c a day is the most promising form of specific therapy in this disease." (Jackson, H., Jr. and Tighe, T. J. G -- New Eng. J. Med., 220 729, 1939.)

## "PENTNUCLEOTIDE"

A MIXTURE OF THE SODIUM SALTS OF PENTOSE NUCLEOTIDES
FOR INTRAMUSCULAR USE

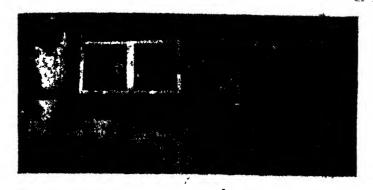
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Medical practitioners overseas who desire further particulars concerning the products mentioned in this inset are invited to communicate as under

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### Oxygen Service

The Medical Profession and Hospitals in London and all over England have created a demand for oxygen tents that we are now fulfilling.

tents are available on rental service for infants, juniors and adults anywhere and at any time day or night.

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# The far-sighted specify -

# WATSON British Made

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Performance over long periods is the only real test of the true worth of x-ray equipment. As any user will confirm, Watson apparatus is built to give trouble-free service year in and year out Maintenance costs are low and a consistently high standard of results assured.

There is a full range of Watson x-ray equipment from portable and dental units to the most powerful type of installation incorporating the well known "Roentgen IV" generator.

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Please state your requirements when we will gladly send descriptive literature,



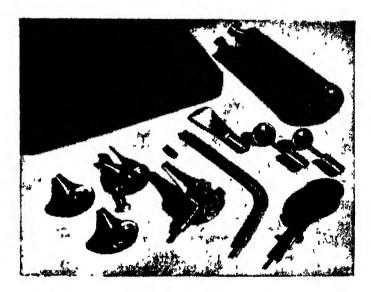
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STANDARD GOWLLAND BRAND SURGICAL INSTRUMENTS are being supplied as standard equipment to the Armed Forces of Great Britain, Dominions, Colonies and Allies, including the U.S.A., Russia and China.

Many years of active service in widely different fields of war have served to prove the excellence of design and production of Gowlland Standard products.

All instruments are chromium plated and interchangeable.

Years of trouble-free life can be relied upon for normal usage.



Made in England and obtainable from all Surgical Supply Houses.

# **B.W. & CO.**

### a mark to remember

Wherever medicinal products are used, the name of Burroughs Wellcome & Co. is recognised as the hall-mark of supreme quality. Constant research, applied to every manufacturing process, ensures that each product conforms to the most exacting standards of purity, accuracy and reliability.

The range of products issued by Burroughs Wellcome & Co. covers every phase of modern therapeutics. It includes 'Tabloid' brand compressed products; 'Wellcome' brand sterile solutions for injection; sera vaccines and tuberculins (prepared at The Wellcome Physiological Research Laboratories); insulin; chemotherapeutic agents; alkaloids, fine chemicals and galenicals.

Each preparation represents the highest degree of pharmaceutical craftsmanship and skill, safeguarded, checked and re-checked at every stage of production by a vigilant system of analytical control.



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(A Subsidiary of Imperial Chemical Industries Ltd.)

In 1939 it became vital for Great Britain to produce immediately a number of essential drugs which formerly were obtainable only from abroad and the research, technical and manufacturing resources of this Company were diverted towards remedying this position.

This emergency work was given priority over long term research in the medical and allied fields but the successful progress which has been made now enables Imperial Chemical (Pharmaceuticals) Ltd. again to direct their energies towards the discovery and production of new and improved drugs based on original research.

Literature on the products at present available will be forwarded on request.

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WE have been manufacturers of Chloroform since 1847, when Sir James Young Simpson demonstrated its anæsthetic properties and approached Dr. Thomas Smith (Founder of our Firm) with a view to obtaining sufficient quantities to carry out his pioneer work. Our long experience enables us to produce an anæsthetic Chloroform of standard composition, UNSURPASSED FOR RE-

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BLANDFIELD CHEMICAL WORKS - EDINBURGH

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#### MOIST HEAT THERAPY

In conditions which require Moist Heat applications—but no specialized nursing care—an ANTIPHLOGISTINE poultice is indicated.

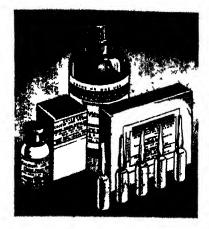
This ready-to-use medicated poultice is applied comfortably hot directly to the affected area. It maintains Moist Heat for many hours.

The comforting Moist Heat of an ANTIPHLOGISTINE pack is effective in relieving the pain, swelling, and muscle spasms due to sprains, strains, and contusions. It is likewise effective in affections of the respiratory system; in relieving the cough, soreness, tightness of the chest, muscular and pleuritic pain.

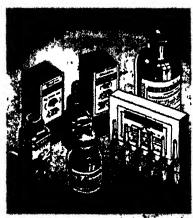
ANTIPHLOGISTINE may be used with chemotherapy.

Antiphlogistine

THE DENVER CHEMICAL Mfg. CO., LONDON, N.W.S









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## **STERAMIDE**

TRADE MARK

## SULPHACETAMIDE

For use in eye injuries and infections





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#### 'STERAMIDE'

Cartons of 50, 100, 250 and 500 grammes

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Cartons of 50, 100, 250 and 500 grammes,

#### 'STERAMIDE' SODIUM 10% SOLUTION

Bottles of 100, 250 and 500 cc Pipette bottles of 25 cc

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30% SOLUTION
Bottles of 100, 250 and 500 cc.
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5 amps)

#### 'STERAMIDE' EYE

OINTMENT
Tubes of 1 drachm; '
Tubes of 25 grammes.

### Tubes of 25 grammes. 'STERAMIDE' TABLETS

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and identifies all
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cases of mental and physical exhaustion headache or insomma, caused by abnormal working conditions, the prolonged sedative and analgesic action of 'Anadin' is of great value.

The synergistic principle of 'Anadin' tablets combines small doses of aspirin, phenacetin and caffeine. 'Anadin' is well-tolerated and unlikely to cause gastric complications.

By reason of its low toxic effect, 'Anadin' can be prescribed with complete confidence in its safety and efficacy.



ANADIN LIMITED 12 CHENIES STREET LONDON W.C.I



Gastric derangement, accompanied by nausea and vomiting, may on occasions interfere seriously with the valuable medication provided by Stilboestrol therapy.

Where intolerance is experienced, a compatible gastric sedative will be found in 'BiSoDoL' Powder. This well-balanced antacid-digestant — with its peptonising and amylolytic agents — helps to combat any anorexia

Composed of bismuth subnitrate, magnesium carbonate, sodium bicarbonate, papain, diastase and peppermint oil, 'BiSoDoL' will be found to be an ideal alkaline sedative.

DOSAGE: One teaspoonful to be given shortly before each dose of Stilboestrol. This dose may be safely increased where acute nauses is marked

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The products of Genatosan Ltd are designed to meet the needs of advancing therapy and are based on the results of chemical, pharmacological and clinical research

#### THIOURACIL AND THIOUREA

New medicaments for the control of excessive thyroid activity and the alleviation of thyrotoxic symptoms. Available in tablet form for oral administration.

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A free flowing sterile powder for theatre use after wound excision. In sterile glass sprinkler bottles (10 gm), which ensure complete asepsis in use.

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Nutritional factors of value in the treatment of subclinical pellagia and disorders of metabolism arising from malnutrition, also, in Vincent's Infection, stomatitis and allied conditions. For oral and parenteral use

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Synthetic analogue of chrysarobin, indicated in the treatment of psoriasis, chronic eczema and epidermophytosis

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Acetomenaphthone for oral medication and Menaphthone for intramuscular injection, in the prophylaxis and treatment of hæmorrhagic conditions due to prothrombin deficiency, e.g. neonatal hæmorrhage, obstructive jaundice

Literature concerning these and other 'Genatovan' specialities may be obtained on request



MEDICAL DEPARTMENT GENATOSAN LIMITED, LOUGHBOROUGH, LEICS.

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# FOR THE TREATMENT OF MALARIA "SOLVOCHIN"

25% AQUEOUS SOLUTION OF QUININE

for

painless intramuscular (intragluteal) injection Isotonic (PH-7.2)

SOLVOCHIN has been introduced for the treatment of malaria. Its parenteral administration is simple and free from complications. The preparation is painless and does not call for prolonged massage of the site of injection. It is economical, and when combined with mepacrine two daily injections for four days are generally sufficient.

Available in 2.2 cc. and 1.1 c.c ampoules

Further particulars will be supplied on request

#### "TRANSPULMIN"

(3% Quinine and Camphor in Volatile Oils)

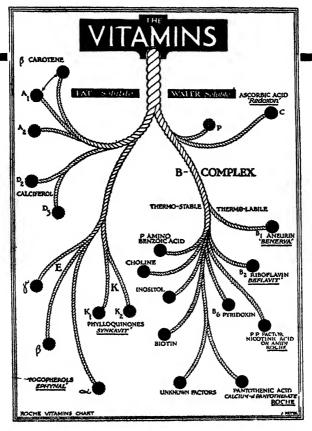
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**BRONCHO-PNEUMONIA** 

Manufactured by :-

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### 'Roche' Vitamin Preparations



Since the first synthetic vitamin—namely vitamin C—was introduced 10 years ago as 'Redoxon' laevo-Ascorbic Acid, Roche Products Limited have directed ever-increasing care to the manufacture of other vitamins, notably 'Benerva' B<sub>1</sub> (Aneurine) and 'Beflavit' B<sub>2</sub> (riboflavine). Oil-soluble vitamins are also made by Roche: 'Ephynal' Vitamin E and 'Synkavit' Vitamin K analogue.

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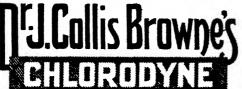
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1 Tubercle, November, 1943

<sup>2</sup> American Review of Tuberculosis, December, 1941



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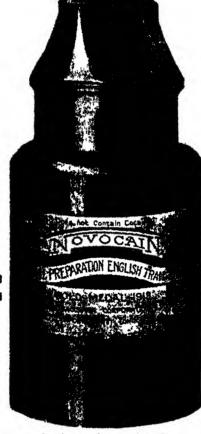
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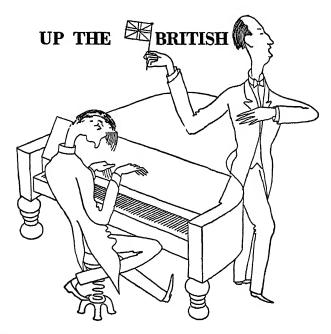
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SIR HENRY TIDY, KBE, MA, MD, (ONON) FRCP A RENDLE SHORT, MD, BS, BSC, FRCS.

#### Contributors:

THOMAS ANDERSON, M.D., FRCPE
T ANWYL-DAVIES, M.D., FRCPE
HAMILTON BAILEY, IRCS
ALFRED E. BARNES, M.B., CH.B., FRCPLT-COL.H.J., BENSTEID, O.B.E., M.C., M.R.CS.,
LR.C.P., R.A.M.C.
JAMES F BRAILSFORD, M.D., PH.D., FRCPLTS

MACDONAI D. CRITCHLEY, M.D., FRCPLIS, P.D. AVIDSON, M.A., M.D., FRCPLIS, P.D. AVIDSON, M.A., M.D., FRCPLE, SIR STEWART DUKE-ELDER, M.A., D.SC., PH.D., M.D., FRCS, SIR STEWART, M.D., FRCPLE, M.D., FRCS, SIR JOHN FRASER, BART, KCVO, M.C., CH.M., M.D., FRCS, CH.M., M.D., FRCS, M.S., FRCS, M.S., FRCS, M.S., FRCS, M.S., FRCS, M.S., FRCS, M.S., M.S., M.D., M.S., M.D., M.C., M.S., M.D., M.S., M.D., M.C., M.S., M.D., M.S., M.D., M.S., M.S

SIE WALTER LANGDON-BROWN, MA.,

MD. ILD, DSC, FRCP (LOND),
FRCPI
AUBREY LEWIS, MD, FRCP.
WE LLOYD, MD, FRCP.
R. M. B. MACKENNA, MA., MD, FRCP.
T. P. MCMURRAY, MCH, FRCS.
SIR PHILIP H. MANSON-BAHR, CMG,
DSO, MD, FRCP, DTM AND H.
COL WILLIAM S. MIDDLETON, USAMC
REGINALD MILLER, MD, FRCP.
WILFRID OAKLEY, MA, MD, FRCP.
RALSTON PATERSON, MC, MD, FRCSE.,
FFR.
R. M. F. PICKEN, BSC, MB, CHB, DPH.
MAJOR-GEN L. T. POOLE, DSO, M.C., MB,
DPH., KHP.
LAMBERT C. ROGERS, MSC. FRCS.
A. RENDLE SHORT, MD, BS, BSC, FRCS.
S. L. SIMPSON, MA, MD, FRCP.
PERCY STOCKS, MA, MD, DPH.
SIR HENRY TIDY, KBE MA, MD, FRCP.
MARGARET C. TOD, MB, CHB, FRCSE.
FACS., FRACS., FRS (EDIN)
F. W. WATKYN-THOMAS, BCH., FRCS.
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- JAMES F BRAILSFORD, M.D., Ph.D., F.R.C.P., F.I.C.S., Consulting Radiologist, City of Birmingham Hospitals, The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, Birmingham Accident Hospital and Rehabilitation Centre, St. Andrew's Baths, Droitwich, and Mental Hospital, Winson Green; Radiological Demonstrator in Living Anatomy, University of Birmingham. Honorary Radiologist, The Queen Elizabeth Hospital, Birmingham, The Royal Cripples' Hospital, Birmingham, and The Warwickshire Orthopædic Hospital; Radiologist, City of Birmingham Carnegie Infant Welfare Hospital, Corporation of Smethwick, and St. Chad's Hospital. (Radiology)

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MACDONALD CRITCHLEY, M.D., FR.C.P., Neurologist, King's College Hospital; Neurological Physician to the Royal Masonic Hospital; Physician to Out-patients, National Hospital, Queen Square; Consulting Neurologist, London County Council, Temporary Surgeon Captain R.N.V.R.; Consultant in Neurology to the Royal Navy. (Diseases of the Nervous System.)

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MAURICE DAVIDSON, M.A., M.D., F.R.C.P., Hon. Consulting Physician, Miller General Hospital, Physician, Brompton Hospital for Consumption; Consulting Physician, London County Council.

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ARTHUR H. DOUTHWAITE, M.D., F.R.C.P., Physician, Guy's Hospital; Honorary Physician, All Saints' Hospital for Genito-urinary Diseases.

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BRIGADIER SIR STEWART DUKE-ELDER, M.A., D.Sc., Ph.D., M.D., F.R.C.S., Surgeon-Oculist to H M. The King; Consulting Ophthalmic Surgeon to the Army; Ophthalmic Surgeon and Lecturer in Ophthalmology, St. George's Hospital. (Eye Diseases.)

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A TUDOR EDWARDS, MA, M.D, M.Chir.Camb., F.R.C.S., Surgeon-in-Charge, Department of Thoracic Surgery, London Hospital; Surgeon, Brompton Hospital for Diseases of the Chest; Consultant Advisor in Chest Surgery to Ministry of Health; Honorary Consultant in Thoracic Surgery to the Army; Civilian Consultant in Chest Surgery to Royal Air Force; late Examiner in Surgery, University of Cambridge; Surgeon to the Westminster Hospital.

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R ST A. HEATHCOTE, MA, DMOxon, FRC.P, Professor of Pharmacology, Welsh National School of Medicine, University of Wales. (Chemotherapy of Bacterial Invasion, Pharmacology and Therapeutics,

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C. LANGTON HEWER, MB, BS., MRCS, LRCP, DA, Anæsthetist, Emergency Medical Service, Senior Anæsthetist, St Bartholomew's Hospital, Hill End Hospital, St. Alban's, and St Andrew's Hospital, Dollis Hill; Anæsthetist, Brompton Chest Hospital and Mount Vernon Hospital, Northwood, Consulting Anæsthetist, West Herts Hospital, Hemel Hempstead and Mid Herts Hospital, St. Albans, Examiner in Anæsthesia to the Royal College of Surgeons

(Anæsthesia)

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- J W. HOWIE, M D, Lecturer in Bacteriology, Aberdeen University, Assistant Bacteriologist, Aberdeen Royal Infirmary and Royal Aberdeen Hospital for Sick Children, Temporary Major, R.A.M C. (Yellow Fever Control)

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R. M. B. MACKENNA, M.A., M.D., F.R C.P., Hon. Dermatologist, Royal Southern Hospital Section of the Royal Liverpool United Hospital; Brigadier, R.A.M.C., Consulting Dermatologist to the Army.

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CLIFFORD WHITE, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G., Senior Obstetric Surgeon, University College Hospital; Surgeon, Samaritan Hospital for Women; Ex-President Obstetrical and Gynacological Section, Royal Society of Medicine; sometime Examiner to the Universities of Cambridge, Durham, London, and Liverpool, and to the Royal College of Physicians and the Royal College of Surgeons of England. (Gynæcology and Obstetrics.)

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### PUBLISHERS' NOTE

It is with a very real sense of gratification that we are able to offer to the Profession the sixty-third consecutive volume of the Medical Annual.

Severe war-time restrictions continue to hamper the activities of all publishers, but the Ministry of Supply, recognizing the essential value of placing the latest information on medicine and surgery at the disposal of the Profession, both in the services and in civil practice, have allotted the necessary quantity of paper for the present issue.

Once again we wish to express on behalf of our readers all over the world our very great appreciation of the valued services so readily given by editors and contributors, especially in these difficult times, without whose co-operation the production of the Annual year by year would be impossible.

THE MEDICAL ANNUAL OFFICES,
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### THE MEDICAL ANNUAL 1945

### INTRODUCTION

BY THE EDITORS

### MEDICINE

VITAL STATISTICS -- "Statistics can prove anything" We all know the gag, which we quote with smug satisfaction when the upholders of rival theories quote statistics apparently both irreconcilable and Usually the competing statistics are not comparable, ırrefutable though there may be nothing stated by which this can be judged so it arises that the trained statistician views the efforts of the "amateur statistician" with a detached, lofty, and immeasurable contempt, while the public do not differentiate between the expert and the amateur in its distrust of both. Nevertheless, statistics are invading the life thus the figures for maternal mortality of the medical profession have attracted the intimate interest of obstetricians for several decades. and the recent statistics of mass radiography of the chest are of the highest importance It is anticipated that after the War statistics of morbidity will become available especially under the ægis of the Ministry of Health The hope may be expressed that the assistance which can be given by practising clinicians as to their form and presentation will not be overlooked.

A review of Vital Statistics is included in the Medical Annual this year for the first time, and an obvious gap is thus filled. The introductory article by Dr Percy Stocks will be welcomed. It is intended to continue a yearly review in future.

Recognition of New Diseases Primary Atypical Pneumonia—The recognition of a disease, or even a syndrome, previously undescribed, always excites interest, and historians diligently search the literature for former records. There is a difference between those diseases which are non-communicable and those which are communicable. In the former category may be placed appendicitis, duodenal ulcer, and Cushing's syndrome. Statisticians may study and dispute for decades the question whether or not the incidence of such diseases is increasing, and clinicians may ponder on what new concatenation of factors has led to their appearance. The last war brought before us several new epidemics, e.g., trench fever, epidemic encephalitis, and possibly epidemic acute nephritis. While these might loosely be described as new diseases, no one imagined that they had not previously occurred.

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Primary Atypical Pneumonia is not a war development, for it was recognized by 1935. Between 1935 and 1939 it appeared to be and probably was increasing in incidence. On the other hand, its full recognition possibly had to await the aborting action of sulphonamides on pneumococcal pneumonia, just as achlorhydric microcytic anamia was concealed in the thick woods of Victorian chlorosis. It certainly would have had to await the recent extension of radiography of the chest. Nevertheless, there can be no doubt of its increased incidence during the War. The special article on this disease will be welcomed, and its author, Col. W. S. Middleton, Chief Consultant in Medicine, U.S.A. Medical Corps, has an extensive experience of the condition both in Europe and the United States.

YELLOW FEVER CONTROL. SCRUB TYPHUS. Yellow fever was the terror of sailing ships in the past, especially those which "sailed the Spanish Main" and the coasts of South America. It was one of the stand-bys of books of adventure for boys in the Victorian age. Gradually its incidence appeared to decline. But of recent years various discoveries and new factors have again brought it into the foreground of international preventive medicine. Recognition of its conveyance by mosquitoes, the great extension of knowledge of its distribution under the auspices of the International Health Centre of the Rockefeller Foundation, and the protective power of a vaccine are all advances of essential importance. But modern interest has been stimulated by two other features - first, the risk of rapid transport of infected mosquitoes by aeroplanes, and, secondly, the curious absence of the disease in the Orient, and especially in India. Every known factor for the spread of the disease is present in India, and it must appear that the immunity of this sub-continent is due to some factor at present unknown. Until it is discovered that some essential factor for its spread is absent in India, the responsible authorities must take every possible step to prevent its introduction, for an epidemic in India would involve an enormous population and would produce a tragedy of the first magnitude. Yellow Fever Control is discussed in a special article by Major-General L. T. Poole and Major J W. Howie, both of whom speak with extensive practical experience.

Major-General Poole and Lieut.-Colonel H. J. Bensted also review fully the subject of Scrub Typhus, of great importance in the campaign in the Far East.

DIPHTHERIA.—Every death of a child from diphtheria is a tragedy which could have been avoided. It was not until antitoxin had been in use for several decades and had cleared the air of the mass of deaths that it became recognized that something more was needed. The merits of active immunization were proclaimed first by a few enthusiasts, who became impatient at the slowness of the profession to urge the benefits of protection and at the unwillingness of the public to see their children receive a mysterious prick. They have now, one trusts, convinced the

profession At last the number of deaths is falling as the degree of immunization reaches a standard sufficient to make a mark, but many years of propaganda remain ahead. Year by year the summaries in the Medical Annual record advance, but any letting up will inevitably be followed by a dangerous retreat. This year the important point is emphasized that a refresher dose is essential three to five years after the initial course, preferably between nine and twelve months.

Mass Miniature Radiography of the Chest Pulmonary Tuberculosis —The past year has seen further advances in what must be regarded as a period of preparation for an extensive attack on pulmonary tuberculosis in the whole population. The difficulties at the moment of a mass attack are obvious, including provision of staff and equipment, and disposal and treatment of the affected. Nevertheless, the preliminary results lead one to be hopeful of a great reduction within a lifetime. The present position of Mass Radiography is reviewed in a special article.

The Interim Report of the Tuberculosis Survey under the Prophit Trust of the Royal College of Physicians analyses an extensive series of observations It is fully summarized by the reviewer on Pulmonary Tuberculosis

Diabetes —Search for an ideal method of administering insulin and for an ideal preparation still continues, especially for very severe cases of diabetes. Experiments on human beings with severe diabetes are difficult, and it is not surprising that different investigators arrive at different conclusions. The evidence for the use of globin insulin in preference to  $P \ Z \ I$  is unconvincing

LEGAL DECISIONS AND LEGISLATION—An important decision on the interpretation of "continuously under care and treatment" in the Herbert Act has been given by the Court of Appeal This reverses a decision in a lower court under which temporary release on parole would have barred a divorce being obtained.

It is surprising that after so many years the question whether negligent medical treatment can increase compensation due under the Workmen's Compensation Act should remain to be decided. The Court of Appeal were actively divided in their views

PREVENTION OF AIR-BORNE AND DUST INFECTIONS—The importance of such infections has been recognized during the War, especially in cross-infections of wounds while being dressed. Much research has been and is still being pursued and the best treatment for floors of hospital wards is being carefully studied.

PHARMACOLOGY AND THERAPEUTICS—Apart from the progress of penicillin—dealt with in another section—there is little fresh in this

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branch. Certain new details of sulphonamide treatment have been investigated, but the main principles are reasonably clear. The cure for sea-sickness still awaits discovery. The Navy looks on with a tolerant smile at the attempts to find it.

Rif Factor.—The solution of the actiology of a disease is always an historic advance. The discovery of the Rh factor led almost immediately to a solution of the origin of crythroblastosis feetalis. At first the iso-immunization theory appeared to afford a simple explanation of all cases. It still remains true for the great majority, but exceptions and complications were soon discovered. The A and B factors are an occasional cause, but a more difficult problem arises from the complexity of the Rh factor itself. The Midical Annual has recorded the progress since 1942, and claborations will probably be discovered in this particularly interesting path for several years to come

DUCTLESS GLANDS. Although unconnected with military needs, considerable literature has appeared on this subject dealing with several important aspects. The value of thiouracil in thyrotoxicosis has been confirmed, and indeed it appears to be even more effective than was at first supposed. The influence of stilbustrol on cancer has been further investigated and is clearly a complex matter.

Dyspersia and Perfic Cicer in the Scruces. Although this group continues to be an important cause of invaliding, the various Services of the Allies have arrived at almost identical conclusions as to the best methods of treatment and disposal, and the subject may be said to be well in hand. As was anticipated, it is less troublesome and prominent among troops in the field and actually in the fighting line than among trainers.

PSYCHATRY AND PSYCHOSIS. Laterature recording advances of value appear to be less than might be expected in view of the amount of field work which is being performed. The search for reliable psychological tests continues. There has been little published on the subject of frontal leucotomy.

### SURGERY

GENERAL SURGERY.—Painful amputation stumps are often a difficult therapeutic problem; resection of the neuroma may be effective if it is tender and relieved by novocain; sympathectomy or chordotomy may be necessary. Sulphathiazole is said to be better than neo-arsphenamine in the treatment of anthrax. When a main artery has to be ligatured, it is well to divide it rather than ligature in continuity, and the proximal tie should be just beyond a branch, so that the full

force of the stream is directed to opening up the collateral circulation, the vein should also be tied, for the same purpose, a rapid blood transfusion helps, so do ice-packs to the limb. Gas gangrene has been much less troublesome in this war than the last, antitoxin and sulphonamides appear to help one another. Ligature of the carotid artery for pulsating exophthalmos may cause hemiplegia, but warning of danger may be given by taking an electro-encephalogram whilst compressing the artery temporarily, to see if there are any signs of cortical distress.

Burns—Much continues to be published on the treatment of burns, strangely, the Germans do not seem to be interested. Pressure bandages are valuable. Anæsthetics for cleaning up in shocked cases may hasten death. A penicillin cream is a good dressing. Dosing with vitamin C is well spoken of

Abdominal Surgery—Blast injuries continue to arouse attention, perforation may be late, as the result of infection and builting of a harmatoma. Barium given per rectum seems to be good treatment for diverticulitis. Most observers, not all, speak well of sulphonamides in powder form as a dusting in cases of present or expected peritonitis, the powder should be sterilized. A new operative treatment is described for duodenal ulcer, by grafting a flap of jejunum into the stomach. A good account is included of total resection of the stomach for carcinoma, a few patients have survived for four years or more, efforts are being made to detect early cancer by giving barium meals to persons who complain of no symptoms.

Neuro-surgery —Very greatly improved results have been obtained in this war in cases of head injury, local application of penicillin is a great safeguard against infection, sulphathiazole is not advised, as it may cause epileptic fits, it is most important to close the skin over a penetrating wound of the brain. Operations to reduce the blood-pressure in cases of hypertension have usually been transient in their good effects, but better results are claimed after a really extensive sympathectomy. A communication is reviewed which suggests that subdural hæmatoma is quite common in infants as a result of pressure during birth, the symptoms may be very vague and inconclusive, the reviewer describes this as an "exceedingly important paper", and says that dozens of cases must be admitted yearly to our children's hospitals, but not recognized.

Chest Surgery—The indications for operation in injuries of the chest are open sucking wounds, continued bleeding, pressure pneumothorax, and very large hæmothorax, a vaseline gauze pack applied with strapping is best as first-aid treatment for open wounds; penicillin instillations are very effective in combating infection of the pleura. So many children with patent ductus arteriosus eventually die of bacterial

Introduction 6 MEDICAL ANNUAL

endocarditis that it is often good treatment to ligature the duct, especially in cases under twelve, with minimal symptoms; a few patients have been saved even after infection has supervened. Removal of the thymus sometimes cures myasthema gravis; early cases give the best results.

GENITO-URINARY SURGERY. A reliable method of anasthetizing the female urethra before cystoscopy is described. Cases are recorded of patients with anuria, after incompatible blood infusion, saved by decapsulation of the kidney. Suprapuble cystotomy is greatly preferable to the tied-in catheter for patients with paralysed bladder. Attention is drawn to the frequency of prostatitis due to the colon bacillus or staphylococci; low backache is a common symptom; massage of the prostate is the best treatment, with sulphonamides by mouth. Epididymitis, also, may be due to these infections. Transplantation of the ureters into the bowel for ectopia vesice should be done before the child is six months old, to anticipate renal sepsis; for adults, preparation with sulphasuxidine, and dieting and rectal aspiration, reduce the mortality. Ulcer of the urethral meatus in children is easily recognized if looked for, but may cause serious obstruction if untreated; the meatus should be enlarged, and regular dilatation carried out. Stress incontinence of urine in women may be relieved by Halban's operation, to correct the cystocele and narrow the urethra.

RECTAL SURGERY. In a review of the treatment of pruritus am it is pointed out that persistence of itching is often due to ill-advised local applications; radiotherapy is not recommended; tattooing with mercuric sulphide is again well spoken of. About 40 per cent of patients with carcinoma of the rectum are alive and well over five years following excision, and in some of those who die the fatality is due to inter-current disease; if the five-year period is safely passed, the expectation of life becomes normal for the patient's age.

ORTHOPÆDIC SURGERY. Important directions are given as to the best site and the best methods for amputations; there is still difference of opinion as to the virtues of the Syme amputation. For purposes of transporting fractures, experience in Libya favoured the use of a combination of plaster with the Thomas splint. Osteo-arthritis of the hip is now treated by fitting the head of the femur with a cup made of some plastic material. Acute osteomyelitis is best treated by a combination of bone drilling and the administration of sulphathiazole. [This was written before the days of penicillin.]

SURGERY IN CHILDHOOD.—Radon continues to find favour in the treatment of the deeper and larger nevi. Penicillin is not of great value in the more chronic forms of osteomyclitis, though very useful in the early and acute phase. A successful injection treatment for umbilical hernia with a phenol solution is described.

### SPECIAL DEPARTMENTS

Obstetrics and Gynæcology —Much interest has been aroused in America, in the medical and lay press, in the subject of caudal anæsthesia for painless childbirth, there seem to be a good many risks and contraindications. Laceration of the perineum into the rectum is so distressing that it is often worth making an attempt to suture the tear much earlier than has been customary

DISEASES OF THE EYE —There is a non-bacterial variety of ophthalmia neonatorum, but it responds well to sulphonamides. Penicillin gives excellent results in cases of chronic blepharo-conjunctivitis, formerly so intractable. Corneal ulcers, also, may be benefited greatly. Foreign bodies lodged in the eye during this war are usually non-ferrous in character and so do not respond to the electro-magnet, the posterior route is advised for extraction.

DISEASES OF THE EAR, NOSE, AND THROAT—Electro-encephalography is a valuable means of judging the progress of otitic brain infection and abscesses. A warning is given that local applications of sulphonamides to the nasal mucosa may do serious harm. Unfortunate complications of tracheotomy are mediastinal emphysema and tension pneumothorax, these are usually due to the operation having been delayed till respiratory distress is extreme.

VENERAL DISEASES—Chancroid clears up quickly under sulphonamides and prolonged treatment is not needful. A technique is described for the bacteriological diagnosis of gonorrhœa. The really spectacular effects of penicillin treatment for this disease are further reported on , gonorrhœal arthritis quickly clears up. Syphilis, also, responds better to penicillin treatment than to any other , the best dosage is being worked out. Massive arsenotherapy has given good results in early syphilis, though it carries a certain risk

ANESTHETICS.—Cyclopropane has proved very useful for shocked battle casualties Trichlorethylene is becoming very popular in this country, but the dose should not be pushed to obtain complete relaxation; it is very effective as an analgesic in dentistry. Procaine and the sulphonamides are therapeutically incompatible

### SPECIAL METHODS

Penicillin.—Readers will be interested in a special review on the indications and contra-indications for penicillin treatment, now that supplies are becoming available.

BLOOD TRANSFUSION.—This subject is becoming very complicated. Large amounts of transfusion fluids are necessary for war casualties in

the tropics, to combat dehydration. For medical amemias, fresh blood, given with the aid of a rotary pump, is better than stored blood. Transfusion into the bone-marrow of the sternum in adults, or of the tibia in infants, is growing in popularity, especially when no veins are available.

RADIOTHERAPY. Caremona of the bladder appears to respond better to radium treatment than to surgery. The Wilms tumour of the kidney in children is very radio-sensitive in some cases, but nephrectomy is necessary as well. Good results are reported after radium or X-ray treatment of malignant growths of the upper jaw. Of non-malignant conditions, tuberculous glands of the neck usually do well under small doses of X rays.

Radio-diagnosis. Stress is laid on the importance of recognizing bronchicetasis in young adults. The value of the barium enema in diagnosing intussusception in children is mentioned. Pheniodol is considered by some to be better than opacol for cholecystograms.

Medicine and surgery are passing through a deeply interesting phase, hastened by war-time experience. The advent first of the sulphonamides and more recently of pencillin, and the hormone treatment of certain cancers such as that of the prostate, have opened new prospects in almost every department of treatment. The experience gained in special centres for neuro-surgery, thoracic surgery, facto-maxillary, and other units is likely to lead to rapid progress when peace returns, as well as under war conditions.

# PLATE I

# ABDOMINAL INJURIES DUE TO UNDER-WATER EXPLOSION (G R CAMERON, MAJOR R H D SHORT, AND SCREEON REAR-ADMIRAL CECIL P G WAKELEY)



Fig A-The explosion of a depth charge Photographs taken at intervals of \$\frac{1}{4}\$ second

Plates I-II by hind permission of the British Journal of Surgery'

### PLATE II

## ABDOMINAL INJURIES DUE TO UNDER-WATER EXPLOSION—continued

(G. R. CAMERON, MAJOR R. H. D. SHORE AND SURGEON REAR ADMIRAL CICE P. G. WARLLEY)



Fig B. Showing two perforations on outer wall of events

### PLATE III

# ABDOMINAL INJURIES DUE TO UNDER-WATER EXPLOSION—continued

(C. R. CAMERON MAJOR R. H. D. SHORI, AND SURGION REAR-ADMIRAL CLOTEP (C. WARLLIN)



Fig. C-Showing blast mjury to the duodenum

### PLATE IV

## ABDOMINAL INJURIES DUE TO UNDER-WATER EXPLOSION—continued

(G. R. CAMERON, MAJOR R. H. D. SHORI, AND SURGEON REAR ADMIRAL CLUED P. G. WARRELLY).

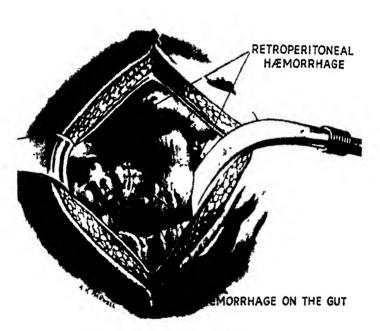


Fig D . Shows a small perforation in the sigmoid colon and numerous subserous and retroperatoneal harmorrhages.

### REVIEW OF THE YEAR'S WORK

ABDOMEN, INJURIES OF.

A Rendle Short, MD, FRCS

Blast Injuries.—We have referred to this subject in previous war-time numbers of the Medical Annual Two further papers may be noticed

C. R. Cameron, Major R. H. D. Short, and Rear-Admiral C. P. G. Wakeley¹ review 20 cases operated on, and 80 more who survived the injury without operation. Plate I gives some idea of the power of a modern depth-charge explosion, and Plates II-II show blast injuries of the intestine. Of the 20 cases operated on, 10 died. All cases showed retroperitoneal and subserous haemorrhages. The cacum was perforated in 9 cases and the ileum in 7; multiple perforations were found 4 times. Perforation may be late, owing to infection and giving way of a hæmatoma. Of 80 patients followed up, the abdominal pain persisted for a few days or weeks, up to three months, most of them suffered from inclama, which lasted up to four months. Eventually, all made a complete recovery. The condition was exactly imitated in goats immersed in water near an underwater explosion.

Surgeon-Lieut Commanders W G Gill and C. P Hay<sup>2</sup> were on a hospital ship close by when the *Hermes* and *Lampue* were sunk by enemy divebombers. Of 595 survivors, 16 were suffering from blast injury of the abdomen, of these, 6 were subjected to a laparotomy, and 2 recovered. Two died, being too shocked for operation. Several patients appeared not to be

seriously injured at first, but suddealy got worse a few hours later and presented the picture of per-The injured forative peritonitis bowel is usually in the lower abdomen; they think the compression forces the intestines down into the bony pelvis, and the resistance leads The decision whether to rupture to operate or not is difficult, especially in early cases. Severe, unremitting, and, especially, increasing abdominal pain, with rigidity and tenderness of the lower abdomen, melæna, and difficult micturition, are the principal indications. The temperature and pulse-rate are deceptive. If the symptoms are referred to the upper abdomen, the surgeon should take into account the possibility that the injury is



Fig 1—An abdominal ward, with suction apparatus and intravenous therapy (Figs 1 and 2 reproduced from 'Surgery, Gynecology and Obstetrics')

thoracic. Those patients who are to be treated conservatively are given warmth, rest, morphine, and intravenous saline or blood.

Gunshot Injuries of the Abdomen.—Articles on this subject during the earlier years of the war were singularly few, but quite a number have appeared during the past year. Major-General W. H. Ogilvie<sup>3, 4</sup> has recorded his experiences of abdominal surgery in the Western Desert (see Fig. 1) If a man

shot through the belly comes under the surgeon within four hours and is badly shocked, he has probably bled severely and is still bleeding; transfusion and operation as soon as some degree of resuscitation has been obtained, are urgently necessary. A man with a perforation of the bowel will need operation for peritonitis, but the leakage comes on slowly, and if by waiting a few hours the patient can be brought to a better equipped hospital it is well worth while. No wounded travel as badly after operation as abdominal cases. It is difficult for the eager surgeon in the front-line C.C.S. to realize

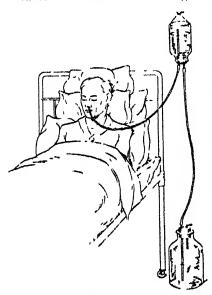


Fig. 2.—Simple gastric suction apparatus using an inverted transfusion flask.

this, and to let the patient pass back to someone else At Alamem the amount of body fluids was 16 bottles of blood and 10 of plasma for every hundred casualties; at Mareth it rose to 45 of blood and 25 of plasma. Wounds of the back should be dealt with first. Incisions should be as simple as possible; gridiron meisions, and transverse cuts dividing the rectus, lead to suppuration and herniation. Often the gunshot wound, excised and enlarged, is the best entry. A sucker is essential. In dealing with tears of the mesentery, Ogilvic advises no mass ligatures, no catgut, and no statches. The arteries should be identifled and tied with fine thread. To stop liver hamorrhage, the best method is to plug the rent with omentum, and oversew with a few catgut sutures. The whole length of the small gut must be inspected; if there is one hole, there will probably be several. Drainage is helpful. Wounds of the colon should be exteriorized if possible. This is best done through a separate incision. If a fixed portion of the colon is punctured, it

should be closed, dusted with sulphonamide powder, drained, and a proximal colostomy performed. The best local application in the abdomen is sulphadiazine, 20 per cent, suspended in gelatin and saline. After-care is important: bed, Fowler's position, continuous gastric suction, and continuous intravenous saline are essential in most cases. The simplest method of obtaining suction is by means of an inverted transfusion flask (Fig. 2). Some statistics are appended:—

Table I.—ALL CASES, COMPLICATED AND UNCOMPLICATED

		NUMBER OF CASES	DIED	MORTALITY
Small intestines Colon Stomach Small intestines Small intestines Small intestines Small intestines	and stomach and bladder	71 68 11 40 5 5	38 35 6 25 3 8	per cent 46 5 51 5 54 5 62 5 60 0 60 0 71 4

A comparison is given with abdominal surgery in the war of 1914-18, as follows --

(main 110mileon Dailey,	Juigery U	1 INDUCEIVE P	raijaiej	
	TOTAL		Mortality	
SITE OF WOUND	Last	Mıddle	Last	Middle
	War	East	War	East
Small intestine Small intestine and stomach Small intestine and colon Small intestine and rectum Small intestine, stomach, and	255	71	65 9	46 5
	14	5	71	60
	85	40	74	62 5
	4	7	100	71 4
rectum	5	2	100	100
Small intestine and bladder	16	5	92 7	60

Table II — WOUND OF SMALL INTESTINE (from Hamilton Bailey, Surgery of Modern Warfare)

The figures are better in spite of the fact that more severe cases were operated on in Libya.

H G. Estcourt<sup>5</sup> and three colleagues write to much the same effect. They worked at a CCS "unusually close to the front line". Many patients reached them alive, who would have died if the journey had been longer. Of their 65 cases, 83 recovered and 32 died. A radiograph to locate lodged foreign bodies is very helpful. Resections are dangerous, and to be avoided if simple closure of perforations is possible. Major A G. R. Lowdon, working in Libya and Sicily, reports 64 cases with a mortality of 48 8 per cent. His methods closely resemble those above described. A paramedian incision is usually best, if the wounds of entry and exit are both in one flank, an oblique lateral incision is good.

D C Elkin and W C Ward? write of the experience at Emory University, Atalanta, of 238 negroes shot through the abdomen Of 181 operated on, the mortality was 46 4 per cent. It is remarkable that peace-time hospital figures are so little better than those of front-line surgery. M. M. Zinninger, however, reports a hospital mortality of only 11 per cent in 46 cases. This improvement is attributed to improvements in anæsthesia, the use of adequate amounts of blood or plasma, continuous gastric suction, and the introduction of sulphonamide drugs.

REFERENCES — Brit J Surg 1948, 31, 51, 'Ibid 67, 'Surg Gynec Obslet 1944, 78, 225, 'Lancet, 1944, 1, 555, 'Ibid 2, 38, 'Edinb med J 1944, 51, 257, 'Ann. Surg 1943, 118, 780, 'J Amer med Ass 1944, 124, 491

ABDOMINAL SURGERY, MISCELLANEOUS. (See also Intra-peritoneal Chemotherapy)

A Rendle Short, M.D., F R.C.S.

Peritoneoscopy.—There has been a revival of interest in this method of examination since Ruddock introduced his peritoneoscope in 1937. The older investigators used a cystoscope. It is said that 300 peritoneoscopes were in use in 1941 in America. R Milnes Walker¹ reports on an experience of 135 cases. Usually a local anæsthetic is all that is required. Naturally, it is only conditions that are visible on the surface when the abdomen is opened that can be seen with this instrument. It is harmless, and nearly painless. Adhesions, or adiposity, limit its usefulness. It is particularly for the diagnosis of carcinoma of the stomach that the method is worth a trial. E. P. Benedict,² of Boston, finds it specially useful for the recognition of carcinoma of the liver, or cirrhosis. He has made 435 peritoneoscopies. [Years ago I used the method on a good many occasions. It is not difficult, and may save an exploratory laparotomy, but of course it has its limitations. If it is worth exploring at all, it is worth exploring thoroughly.—A. R. S.]

Post-operative Treatment.—S. Eisenhammer, of Johannesburg, discusses the question of the correct amount of fluid and sodium chloride to be given intravenously after abdominal operations. He quotes largely from the important communication of F. A. Coller and W. G. Maddock. About 4.5 g sodium chloride given intravenously is enough for the daily needs of the body; the maximum is 9 g. These figures conveniently correspond with 500 to 1000 c.c of isotomic salme. When sait has been lost, by vointing or sweating, this also must be replaced. About 2500 c.c. of water is necessary to replace daily loss, and this is best given as isotomic 5 per cent dextrose solution. Here again, abdominal fluid loss must be made up by increased intake. Diminished output of urine is, of course, a token of dehydration.

Alan Shorter,4 of Sydney, discusses early rehabilitation in abdominal surgery

The methods recommended are as follows.

 $1st\ and\ 2nd\ day$  . (1) Thoracie breathing. (2) Coughing. (3) Retraction of abdominal wall.

The chest is usually found to be rather rigid, and breathing shallow perhaps difficult. The chest should be laterally expanded in inspiration and gentle forced expiration should be promoted by even steady manual pressure on the lower ribs. The volume of tidal air is soon increased and the chest wall becomes relaxed and more mobile.

For coughing, the patient is first assured that he will not burst his wound. Then gentle firm manual pressure is applied over the area and steady forced expiration is encouraged. Loose phlegm is usually expelled in surprising amount. This treatment is continued till the breathing is free and breath-sounds are clear.

8rd and 4th day (1) Abdominal contractions. The abdominal wall should be shortened in expiration, not merely held rigidly contracted. (2) Exercises for legs entailing movements at hip, knee, andle, and toe-joints

4th and 5th day (1) Stronger work for abdominal muscles and legs. (2) Movements for head and arms.

6th and 7th day. The above exercises can now be done freely and with full range of movement, provided there is no contra-indication in chest or abdomen. Trunk exercises are added, such as flexion, extension, side-flexion, and especially rotation. All retractions of the abdominal wall are performed with expiration.

8th to 14th day: The patient does these exercises three times daily, the duration depending on his age and strength, stopping short of fatigue. Extension of back and legs is added as in the erect posture with pressure of the feet on the foot of the bed.

After 14th day: More strenuous exercises for trunk and limbs, especially for muscles of back, abdomen, gluter, and quadriceps.

On the 17th day after operation for hernia the patient is allowed up, if all is well. Also after paramedian incision for laparotomy, if there is no special reason for long recumbency. After appendicectomy via muscle-splitting incision the above exercises are speeded up and the patient is got up on the 10th day. He walks fairly well except for slight giddiness due to change of posture. Difficult walking and balancing exercises are then taught. On the 2nd and 3rd day up he is taken to the gymnasium to join a convalescent class for general exercises and games. Modified deck quoits is a suitable and popular start.

After being up a week he is in the advanced class and can do vigorous exercises without discomfort—e g, play table-tennis or go for long walks and cross-country runs. He is now ready for discharge and in another fortnight at most should be fit for any kind of work.

Two Spanish articles come from the pen of Enrique Mariscot, 5, 6 of Pontevedra He puts in a plea for getting the patient up on the third day or thereabouts, principally as a means of avoiding post-operative phlebitis and pulmonary embolism. After 1192 laparotomies so treated, only one developed pulmonary embolism, and that not in a severe form Another advantage is the avoidance of post-operative flatulent discomforts Pre-requisites for the early getting out of bed are a completely aseptic wound, absolute hæmostasis, and impeccable reconstruction of the abdominal wall. His cases included 109 gastrectomics, 77 operations for acute appendicitis and 250 interval cases, and 899 hermotomies. [It is quite probable that the surgeons of the future will get their abdominal patients out of bed much earlier than has been the custom in the past, but it is to be hoped not as a 'stunt' in all cases suitable and unsuitable, but with due discrimination according to the requirements of the individual patient The present-day tendency is to keep hernia repairs in bed not a shorter time than formerly, but a longer, 18 to 21 days -A R S]

Burst Abdomen. From time to time we have had to comment on what would appear to have been the startling frequency of this disaster in some American clinics Are we too complacent in thinking that it is quite rare in British surgery? A Tashiro,7 of Cincinnati, finds that there have been 55 cases of "wound disruption", that is to say, that some "portion of the peritoneal cavity, or its contents, appeared in the wound " out of 8346 laparotomies (0.65 per cent). There were 22 deaths Patients treated by secondary suture showed a liability to intestinal obstruction, and to herma. Alleged causes are post-operative strains, primary or associated debilitating disease, hypoproteinæmia, and vitanum C deficiency. Exploratory laparotomy for carcinoma or some form of intestinal obstruction, cholclithiasis, and gastric resections, furnish the largest number of disruptions [Frankly, we think this is an appalling story. Better methods of wound closure surely succeed in preventing burst abdomen, except in septic wounds, and patients exhausted by carcinoma. or intestinal obstruction, or tuberculous disease - A R S]

Acute Retroperitoneal Infections. II Neuhof and E E Arnheims present a study of 65 cases observed over eighteen years at a New York hospital They classify them as lumbar abscess, iliac abscess, and diffuse retroperitoneal phlegmon. Permephric, subphrenic, and pelvic abscesses are not included. Of the 25 lumbar abscesses, the origin was unknown in 9, in the other cases the appendix, the kidney, and distant foci seemed to be primary. Of the 28 iliac abscesses 8 were of unknown origin; in the others, the iliac lymph-glands and the appendix were most frequently to blame. There was a history of injury in five cases In both types of abscess, staphylococci, streptococci, and B. colt were found. The abscesses are commoner in children. The symptoms were pain, fever, and spasm of muscles. Sometimes a lump could be felt. The thigh might be held flexed, from psoas involvement Examination under an anæsthetic facilitated diagnosis. The mortality after dramage of the abscess was 8 per cent. All the diffuse phlegmon cases died gnosis was difficult; marked toxenua and abdominal distension were suggestive. The appendix was the commonest source of infection All retroperatoneal infections are best treated by an extraperitoneal approach. Major G. E Parker describes 5 cases of retroperatoncal gas, 4 of which were due to gunshot wound. Three of the patients died The gas was derived from the bowel in 2 cases, from the lung in 2 others, and in 1 gas-forming bacilli were the source.

Acute Duodenal Fistula.—A simple and efficient apparatus is described by M. J. Thorstad, 10 which collects the fluids coming from a duodenal fistula, and carries them back, by means of a jejunostomy, into the alimentary canal.

This is necessary to save the patient's life. A metal McCollum tube was inserted into the fistula and continuous suction kept going. About 3000 c.c. a day poured out at first. This was all returned to the jejunum, together with 6 to 8 oz at a time of nutrient fluid containing milk, cream, eggs, fruit juice, sugar, and yeast. On the fiftieth day, the fistula closed spontaneously

REFERENCES - Proc. R. Soc. Med. 1943, 36, 445, New Engl. J. Med. 1944, 230, 125, S. Afrimed. J., 1944, 18, 211, Lancet, 1944, 1, 243; Med. esp. 1948, July. 42; Ibid. 1944, 11, 284; Surg. Obstet. 1944, 78, 487, Inn. Surg. 1944, 119, 741, Lancet, 1944, 2, 5, 10/lnn. Surg. 1944, 119, 770

### ACHLORHYDRIA AND REPLACEMENT THERAPY WITH DILUTE HYDRO-CHLORIC ACID. (See Anamia, Pernicious.)

ACNE VULGARIS. R. M. B MacKenna, M. 1., M.D., F.R C P.

For many years the endocrine factors which obviously must play a part in the aetiology of acne vulgaris have been discussed, but it is only recently that a crystallization of opinion in this matter has occurred.

The association of acne with puberty and adolescence has been noted for centuries; so have other facts concerning the malady, which need not be enumerated here, but which all serve to indicate that there must be a linkage between the activities of the sex glands and the manifestations of the disease.

In a discussion of the actiology of acne vulgaris, J. T. Ingram<sup>1</sup> states that in this disorder the balance of androgenic and cestrogenic hormones in the patient's circulation is a factor of considerable importance, although our knowledge is not yet sufficiently comprehensive to allow us to interpret this in clinical terms. He attributes to H. W. Barber and P. M. F. Bishop<sup>2</sup> the suggestion that ache vulgaris of clinical degree is a male characteristic due to androgenic preponderance over estrogenic hormone which may be corrected by the administration of distrone, he avers that he has in many instances seen benefit in males from the administration of stilbæstrol in doses of 1 mg. daily for six weeks, in females, good results have been achieved by the administration of 0.5 mg. of stilbæstrol for seven to ten days after menstruation. Ingram states that this treatment is safe for short periods and merits usage in selected cases. When prescribing cestrogenic hormone, some prefer to use hexcestrol, which causes less gastric upset in many cases; it is slightly less active than stilbæstrol when given by the mouth, but is more active by injection.

Barber and Bishop have shown that severe pustular acne in the precedous young male may be rapidly brought under control by the implantation of a crystal of estradiol, 200 to 250 mg, gynæromastia and suppression of libido follow this procedure, but disappear when the crystal is removed. If the acne recurs after the removal of the estradiol, it can be controlled by oral therapy.

Ingram states that, in women, acne associated with clinical evidence of ovarian deficiency responds better to hormone therapy than acne associated with overaction of the adrenals. He has found that persistent indurated acne of the chin, which occurs in some women at or after the menopause, responds well to cestrogen therapy.

W. J. O'Donovan<sup>3</sup> has accumulated some evidence, which he does not yet regard as being conclusive, that persistent indurated acne of the neck in men may respond to therapy with cestrogen; further investigation of this matter is being pursued.

The response of acne vulgars in both sexes to the administration of cestrogen, and the statement that acne is a manifestation of androgenic preponderance over cestrogenic hormone is puzzling to many persons who do not appreciate

the fact that most sex hormones have bi-sexual properties. This matter has been reviewed in the Extra Pharmacopæra, and the opinion expressed there may be summarized as follows researches by Korenchevsky and others have shown that there is no justification for differentiation of the sex hormones into two groups, male and female. All destrogens have some androgenic activity, and all androgens have some estrogenic activity, with but few exceptions bi-sexual property must be considered the common attribute of nearly all sex hormones.

Ingram emphasizes his belief that the psychological and emotional stresses and strains which accompany the pubertal and adolescent period are as important as the endocrine factor in the aetiology of acne vulgaris. Probably this is an overstatement, but responsibilities and anxieties in relation to religion and sex, work and play, family and outside relationships, may influence the course of the disease to an extent that is not commonly recognized. In some cases, when the lesions have developed, their appearance causes a further emotional embarrassment which may be harmful to the patient, although in the majority of cases this embarrassment is not apparent. In the treatment of the disease, sympathetic and intelligent discussion of his problems may be of great help to the patient, Ingram recommends that if the patient is unduly hypersensitive, \(\frac{1}{2}\) gr. of luminal may be prescribed to be taken every night, to relieve his anxiety

The most recent advances, therefore, in our understanding of the problems of aene vulgaris are our increased knowledge concerning the endocrine factor and our increasing wisdom concerning the associated psychological difficulties which may beset the patient. Little else remains to be recorded unless it be the insistence of some authorities that acne patients—like all other seborrheic subjects—require a high intake of vitamin B complex in their diets

REFERENCES -1 Practitioner, 1944, 152, 304, 2Cited by Ingramt, 2Personal communication; 4Martindale's Extra Pharmacopæia, 22nd ed., 1941, 732, London, 2Brit. med. J. 1937, 2, 896

ADDISON'S DISEASE. (See ADRENAL GLANDS)

ADRENAL GLANDS. Sir Walter Langdon-Brown, M.D., D.Sc., F.R.C.P.

THE CORTEX

Desoxycorticosterone in Adrenocortical Insufficiency. - As others have noted, desoxycorticosterone (now contracted to desoxycortone by the Medical Research Council) can produce excessive retention of salt and water with resulting ordenia, hypertension, and cardiac failure, especially if extra salt is given to supplement the therapy. One of us (S. L. S) has observed ædema of the lungs, asthenia, and cardiac failure associated with depressed potassium serum levels, even in the absence of hypertensive effects. This is especially liable to happen when desoxycortone alone fails to produce adequate clinical improvement in severe grades of Addison's disease F. Henri correctly observes that desoxycortone is only one of the hormones of the adrenal cortex He found progesterone, testosterone, and æstrone of some help in Addison's disease, and thinks that they improve the deficiency of glycogen reserves However, the hormone of the adrenal cortex which has a specific effect on carbohydrate metabolism is corticosterone, which has been isolated, but the production of which on a large scale offers at present many technical difficulties. Liquid extracts of the adrenal cortex have effects both on sodium chloride retention and carbohydrate metabolism, but large doses are required and are cumbersome for continued administration.

Adrenal Glands 16 MEDICAL ANNUAL

Clinical Use of Extracts from Adrenal Cortex. - In a group of 158 patients treated with desoxycortone acetate, supplemented with adrenal cortex extracts in emergencies only, G W. Thorn2 found that 30 per cent succumbed in a period of three years' treatment, compared with an 80 per cent mortality in the same period prior to 1980. For treatment of adrenal crisis (acute severe insufficiency) he recommends (1) A litre of normal saline with 5 per cent glucose intravenously, (2) 25 cc. of adrenal cortex extract added to the saline. and 10 esc injected intramuscularly; (3) 20 mg of desoxycortone acetate injected immediately and then 5 to 10 mg daily while watching for the danger of excessive fluid retention. In more chronic insufficiency Thorn advocates: (1) Sodium chloride only, 3 to 6 g. daily (1 g. enteric-coated tablets) for mild degrees of insufficiency; (2) 25 mg to 5 mg, of desoxycortone injected daily, and supplemented with 3 g of salt daily -the appearance of puffiness of the eyes and ankles indicates excessive dosage; (3) After a period of injections, e g., three months, desoxycortone pellets implanted in the subcutaneous tissues of the scapular region (or abdomen). For each 0.5 mg, of hormone injected daily, one pellet of 125 mg should be implanted; thus for 5 mg. daily, ten pellets would be implanted. In our experience this dosage is too high, and if a patient has more than 600 mg. of desoxycortone implanted, additional salt should only be given with the greatest caution, as fluid retention and depression of potassium levels may follow.] As the effect of the pelicts gradually wears off after 4 to 6 months, supplementary injections of desoxycortone are given. During infections, therapy should be supplemented with injections of adrenal cortex extract.

Diagnosis of Adrenal Tumours by Estimation of 17-Ketosteroids in Urine. — An interesting series of average normal values of 17-ketosteroids exereted in 24 hours is given by N. H. Callow and A. C. Crooke<sup>3</sup>.

	Men	Won	1175
Crooke and Callow	n n mg	41 1	
Talbot et al Fraser et al.	15 0 mg 13 8 mg	10 2	
l'atterson et al.	13 3 mg	7 1	
Talbot - Children 4 7	yr 18 mg.		-,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	2 yr 40 mg.		
12-1	5 yr 82 mg		

Of 19 examples of adrenal tumour from the literature, 17 had values for 17-ketosteroids as high as four times the normal. However, in many cases of virilism and basophilism, associated with adrenal hyperplasia, values were as high or almost as high as those with adrenal tumour. Further, in one of the cases of basophilism due to an adrenal carcinoma, with metastases, here recorded, the values of 17-ketosteroids in the urine on two occasions were only 14.5 mg. and 20.0 mg. per 24 hours. Such relatively low values are, however, exceptional, and are ascribed by the authors to the age of the woman, 61, and her severe state of illness. It is, however, clear that high values for androgen assays in urine do not constitute an absolute differentiation between tumour and hyperplasia of the adrenal gland, and this was pointed out by one of us (S. L. S.) in 1984 and 1986. It is what one might expect from a comparison with thyrotoxicosis due to hyperplasia or toxic adenoma(s). The authors, however, tend to confirm the observations of Talbot, and of Crooke and Callow, that the presence of dehydroisoadrenosterone, especially if constituting more than 10 per cent of the total 17-ketosteroids, may be diagnostic of adrenal neoplasm, as distinct from hyperplasia.

R. Luft' also reviews work in this field, and indicates, as have others, that the total androgens, or "andrins", as he calls them, as measured by the calorimetric determination of 17-ketosteroids, corresponds in some measure

with biological assays but includes a variety of substances, some of which have only weak biological activity. The chemical reaction was originally devised by Zimmerman, and is based on the colour reaction between 17-ketones and m-dinitrobenzene in the presence of alkali Callow improved upon the original method The author confirms Callow's findings of high values with adrenal tumours, low values in Addison's disease, and low or normal values in castrated men or ovariectomized women, but obtains values above Callow's upper limit of 15 mg per 24 hours in normal individuals This is dependent upon further modification of chemical methods, and shows the need for accepted standardization of assay, or of each investigator stating his normal range of values, eg, 5 to 15 mg of 17-ketosteroids excreted in 24 hours, as determined on a series of control patients, male and female There still remains, however, the question of the qualitative analysis of the total 17-ketosteroid content, which has already been shown to have diagnostic significance findings of androgens with adrenal tumours, and in gonadectomized humans, has indicated the adrenal gland as an important source, and more direct evidence is the isolation by Reichstein of an unsaturated triketone, adrenosterone, and by Reichstein and von Euw of a keto-compound with an even stronger androgenic activity

### THE MEDULLA

Septicæmia and Purpura with Adrenal Hæmorrhage in the Adult (Waterhouse-Friderichsen Syndrome).—This rare disease is usually recorded in children, but an epidemic of meningococcic meningitis permitted H B Thomas and C D Leiphart<sup>5</sup> to observe 2 cases in adults

In the first case, a man of 34, in normal health, developed an upper respiratory infection. On the third day he experienced weakness, fever (104° F), malaise. During the night he vomited and had severe pains in the back. The next morning he became unconscious, and the skin became purple and mottled. He was cyanotic, dysphoeic, and delirious, and suddenly died Autopsy showed meningococcal septicæmia involving all the organs (heart, liver, spleen, etc.), and extensive hæmorrhage in both adrenal glands

In the second case, a man of 48, mildly ill for three days, with an upper respiratory infection, suddenly became very ill with severe chills, vomiting, perspiring, pyrexia (105° F) He became irrational and cyanotic, and had general and lumbar pains The spinal fluid was normal Large ecchymotic patches appeared all over the body He died within 48 hours showed a meningococcal septicæmia, with hæmorrhages in the adrenals, lungs, The authors conclude that "adrenal hæmorrhage is merely liver, and kidneys part of the generalized bleeding diathesis and is not concerned per se with the rapid death" In confirmation of this view they quote the observations of Williams on 17 children with fulminating meningococcic septicæmia, in which the clinical features were identical, but only 9 presented bilateral adrenal Nevertheless, they advocate intravenous saline and cortical extract, as well as sulphathiazole, in the treatment of suspected cases believe that "the meningococcus has been found to be the chief, if not the sole, actiological agent", and advocate awareness of the symptoms during meningococcal epidemics They summarize the clinical syndrome as follows "After a few days of mild malaise the serious symptoms appear and progress with alarming rapidity, so that the duration of the disease is measured in hours and not days Chills, fever, sweating, and manifest weakness appear together as the first complaints General aching, with abdominal pain or cramps, is quickly followed by bile Cyanosis is usually extreme and appears early, and is frequently the sign that attracts the attention of the family to the Adrenal Glands 18 MEDICAL ANNUAL

seriousness of the situation. In a few hours the fever is usually over 102° F., with a rapid, weak, pulse, and evident hypotension. Petechiæ appear over wide areas, and rapidly coalesce into large ecchymotic spots with amazing

rapidity"

Tumour of the Adrenal Medulla,—L. R. Broster and R. C. McKeith<sup>6</sup> report a case of this rare condition in an aircraftsman of 29. In 1987 he began to experience transient nausea, palpitations, and weakness on rising in the morning. During 1938 and 1939 other symptoms were headaches, palpitations, giddiness, nervousness. In 1940 he felt weakness in the legs. These symptoms occurred in attacks lasting a few minutes to an hour, once or more often during the day. He also had pain in the left loin. In July, 1941, he awoke one day with epigastric pain and vomiting and was admitted to hospital in a collapsed condition with blue cold nose, ears, hands, and feet. The pulse was small and hard, and the blood-pressure 196/167. He was treated by rest, warmth, and morphine, and two days later blood-pressure was 125/100. (He had complete transposition of viscera, and dextrocardia, and female distribution of hair, which is unusual.)

Investigations. Normal serum chloride and sodium, but raised potassium, 46 mg. per 100 c.c. (normal 20 mg.). The white-cell count was 21,200, neutrophils 82 per cent. Intravenous pyclography showed depression of the left kidney and calices. Laparotomy showed a left adrenal tumour the size of a small tangerine orange, and this was removed through a lumbar meision two weeks later. During manipulation blood-pressure rose to 225/145, and then fell to 90/70 ten muntes after removal of the tumour. An intravenous injection of 10 c c of very dilute adrenaline hydrochloride. An intravenous injection of the patient, and a normal blood-pressure of 120/80. After a few minor attacks during convalescence, he has remained completely well.

The tumour was a malignant phæochromoblastoma, and contained 8 mg per gramme of adrenaline (normal 0.4 mg). Deep radiation has been given in view of the malignancy. The right adrenal appeared normal at operation. REFERENCES.—1Disch med Wachr. 1942, 68, 318 (abstr in J. 4mer. med. iss. 1943, 123, 386), 31. Amer. med. Ass. 1944, 125, 10. \$1.0. ancet. 1944, 1, 464. 4. Acta med scand 1943, 115, 277; 31 Amer. med. Ass. 1944, 125, 884. Brit J. Surg. 1944, 31, 898

### ADRENOGENITAL SYNDROME. (See PITUITARY GLAND.)

### AIR-BORNE AND DUST INFECTIONS: PREVENTION OF.

Ralph M. F. Picken, M.B., Ch.B., B Sc., D.P.H. Antiseptic Sprays and Vapours.—A summary of the work of R. J. V. Pulvertaft at the National Institute of Medical Research in 1940–41 has now been published. The test organism used was a  $\beta$ -hæmolytic streptococcus, Group C, and the following antiseptic mists were found effective against freshly sprayed bacterial mists: eugenol carbinol, sodium hypochlorite, hexyl resorcinol in propylene glycol, and catechol. Their rapidity and persistence of action varied, and these properties seemed to be negatively correlated with one another No significant bactericidal effect could be demonstrated on dust-borne microorganisms. Among organic solvents of antiseptics propylene glycol is probably the only one worth considering, but it cannot be used for hypochlorites and is expensive in this country. Continuity of spraying of the air with antiseptics may enable a very small concentration to be used effectively. Antiseptic aerosols were not found to increase the resistance to respiratory infection when animals were exposed to infection immediately after breathing aerosol-treated air

Pulvertaft concludes that a good bactericidal mist should be capable of reducing air-borne bacteria by 90 per cent in an air concentration of the antiseptic of 1 g. in 20,000 c. ft. Spraying should not be necessary in occupied

spaces except at times of epidemic respiratory disease. When mists are used they should be evenly distributed by several small emitters, continuously and mechanically operated. Sodium hypochlorite has the advantages of cheapness, non-toxicity, efficiency in low concentrations, and its deodorizing property, but it must not be issued in large droplets. The toxicity of other agents is probably unimportant in the concentrations and quantities it is practicable to use.

E Bigg, B H Jennings, and S Fried² have experimented in a large enclosed space with glycol vapours emitted either by air-scrubber or by heating, and distributed by circulating fans. A concentration in the air of 0.2 mg per litre of propylene glycol or 0.005 mg per litre of triethylene glycol in this closed room completely destroyed staphylococci and streptococci nebulized in saliva. Lesser concentrations may suffice to control air-borne disease, substantially higher concentrations produce fog, which is undesirable. Relative humidity must be not less than 40 per cent. The writers conclude from these and previous experiments that glycol vapours are effective in such low concentrations as to be imperceptible, odourless, and non-toxic, and that the cost in the USA is minimal.

The same workers<sup>3</sup> have examined the fire risk arising from glycols. They find that in the concentrations of vapour used there is no fire hazard, and that the risk of fire in storage or vaporizing devices is greatly reduced by the addition of water

T. N Harris and J Stokes<sup>4</sup> have made a clinical test with glycol vapours in the control of mild upper respiratory infections—namely, common colds, tracheobronchitis, otitis media, and acute pharyngitis. For the experiment, which extended from October to April, 1942–43, they used six wards in a children's institution where nearly all the children were almost entirely confined to bed. Three wards on one floor were used for the test and three on another as control, but the test and control wards were interchanged every three weeks Glycol was emitted by heat from units at each end of the ward and distributed by fan, 600 c c. of propylene glycol being required daily. The results may be summarized as follows—

	RESPIRATORY	
	Total	Per Week
Control wards	100	18
Test wards	5.	0 09

The mean concentration of propylene glycol was 0 069 mg per litre when the distributing fans were used, in a brief experiment with triethylene glycol about a tenth of this concentration was used Relative humidity was low (85–40 per cent). No mention is made of fogging (see above). Plate-counts of colonies per Petri dish per hour showed a reduction from a mean of 81.3 in control wards to 13.4 in test wards, when propylene glycol was used, and from 91.1 to 2.94 when triethylene glycol was under trial. The writers conclude not only that glycol vapour can greatly influence the occurrence of viral respiratory infections under such carefully controlled conditions, but also that these events support the view that such infections may be spread through the air at fairly long range, as well as by direct droplet hits

Ultra-violet Radiation.—W F and M W Wells, 5 continuing to examine the results of their experiments in the control of infection in schools in Philadelphia, 6 postulate that institutional infectious diseases of the air-borne type pass from the sporadic to the endemic and epidemic phases as the "atmospheric density of susceptibles" increases, or, in other words, as the volume of air change per susceptible per minute diminishes. Mechanical air change can be replaced by properly distributed U.V.R. Ventilation or its equivalent materially raises the epidemic flash-point in a classroom as measured by the percentage of

susceptibles exposed to risk. They suggest from their experience that a tenfold increase of winter ventilation above the usual in American schools, or its equivalent by the application of U.V.R. to the upper air, will control epidemic spread.

R. Schneiter, A Hollaender, and a number of colleagues, have made careful observations over two years of the effect of U.V.R. installed in large, naturally ventilated dormitories of a training school for boys. Two dormitories were fitted with UV.R. lamps, and two were used as controls. The rays were directed upwards from distributed lamps and so adjusted that radiation at bed level was always below the safety limit -namely, 5 ergs per sq cm. per Air samples were taken at monthly intervals at times of the day when dust disturbance varied; floor dust was also sampled during cleaning; nasal swabs from ten boys in each ward were examined, and careful note was made of the incidence of sickness. The irradiated wards had significantly lower bacteriological air counts, but much less difference in the dust counts lococci predominated for most of the time, but streptococci prevailed during one period of five months; in this respect the nasal swabs corresponded with the While there was thus definite reduction of potential infection other samples by air and from dust in the irradiated dormitories, no difference whatever was noted in the incidence of respiratory infection as judged by hospital admissions

Oiling of Floors and Bedclothes. In a carefully planned experiment, J. Wright, R. Cruickshank, and W. Gunn<sup>8</sup> have examined the effect of treating the floor with spindle oil, and bedelothes, personal garments, etc., with technical white oil in a measles ward, using an identical ward as control. The experiment lasted twelve weeks, during the first three of which only the test ward floor was oiled, while the clothes and garments were treated as well as the floor for the rest of the period. Nose and throat swabs were taken from all immates at the beginning of the period, and of all subsequent admissions, and were repeated weekly. Bacteriological examinations were made of the air, collected by slitsampler every 7-14 days during morning bed-making and sweeping. The prevailing infection in both wards was Str. pyogenes, Type 6. It was harboured at the beginning by 86 and 89 per cent in the control and test wards respectively, during the first three weeks it was acquired by 58 and 59 per cent; and the middle-ear complication-rate was 18 per cent in both wards. Oiling of floors by itself was therefore not effective, although the air-counts were substantially lower at the third week in the test ward. The full anti-dust measures, however, immediately caused a reduction in air-counts of bacteria generally and of streptococci by 91-99 per cent; the Type 6 cross-infection-rate was only 186 per cent, as compared with 788 per cent in the control, and the middle-ear complication-rate 2.8 per cent as against 14.3 per cent. The value of these methods was therefore fully demonstrated.

In association with the above inquiry, F. C. Harwood and J. Powneys have shown that it is possible to oil bedelothes, etc., by the use of suitable emulsifiers, in such a way as to eliminate the need for extracting oil from the used liquor. The cation-active emulsifier "fixanol C" was effective for woollen articles, but for cotton goods treatment with both "fixanol" and the anion-active "teepol" was required. The latter process was of more general use since most so-called woollen goods contain some cotton fibres. These methods are applicable on a large scale in any hospital laundry observing a correct washing technique.

P. H. R. Anderson, J. A Buchanan, and J. J. MacPartland<sup>10</sup> examined the effect on respiratory infection of treating the floors of a training centre barracks (Unit A) with spindle oil as compared with almost identical barracks (Unit B) not so treated. The experiment lasted from the beginning of December, 1942, till the end of March, 1943, the floors being re-oiled monthly. There was close clinical collaboration between the medical officers of the two

barracks The weekly average rate of respiratory infections in Unit A was 7 per 1000 men, as compared with a rate of 38 in Unit B. The contrast was notable in every one of the seventeen weeks of the experiment. Further, Unit B sustained a severe outbreak of colds between the middle of February and the first week of March, which Unit A escaped

Effect of Daylight on Dust-borne Bacteria.—Interesting observations have been made by L P Garrod<sup>11</sup> on dust-borne infection and the influence of day-Swabs of dust from the floors of wards in the neighbourhood of each bed frequently contained Str puogenes, but the growth was much more profuse if the bed was occupied by an infected case Positive swabs were much less common (18 per cent) in well-lighted first-floor wards than in ground-floor wards with partially obscured windows and therefore badly lighted (72 per cent) On both floors samples of dust on or close to windows were consistently free from streptococci, whereas they were present in 41 per cent of samples from projections below window level but above the floor, and in 56 per cent of samples from the floor itself He therefore devised an experiment with dried pus. in various dilutions, exposing it on slides in covered Petri dishes to south and north light close to glazed windows, and compared the survival time of Str puogenes so exposed with that on similarly prepared slides in a dark cuoboard and a refrigerator The streptococci died in 1-10 days when exposed to south light and in 6-13 days under north light, as compared with 18 days (in highest dilution) to 108 days in the dark cupboard Refrigerator survival was still longer in one experiment. It should be noted that daylight was relatively lethal although falling through two layers of ordinary glass, but survival in south light was naturally rather longer in winter than in the spring or autumn When infected dust was scattered in Petri dishes and exposed to north light in July streptococci were reduced by about 98 per cent in a few days, while the cupboard dust showed little change, but duplicate counts varied When heavily infected dust was concentrated to its finer elements and kept in tubes. it did not cease to yield Str puogenes after ten winter weeks either in north light or in the cupboard, and it was resistant in such dust even to UVR The main point of interest was that Str puogenes could be recovered after 195 days in such concentrated dust kept in the dark, the longest survival on record The disinfectant action of ordinary daylight on dust remains, therefore, to be proved experimentally, but the ward tests suggest that light has such an effect under natural conditions It may be noted that L Buchbinder 12, 13 and his colleagues have found that fluorescent lamps give a light equivalent to daylight in germicidal power per unit of illumination, but the total intensity is normally too low to have much practical effect

Infection Carried by Flies.—Working in the same hospital as Garrod at a season when flies abounded, R. A. Shooter and P. A. Waterworth<sup>14</sup> trapped flies on culture media in two wards and compared the resulting cultures with those from flies similarly caught in a laboratory. Of 27 flies caught in the wards, 3 gave sterile plates and 9 gave cultures of hæmolytic streptococci, of which 3 belonged to Group A. Of 22 caught in the laboratory, 5 were sterile and none gave hæmolytic streptococci. Two of the 3 Group A strains were from the same ward and were both of Type 4. During the following two months 8 Type 4 infections occurred in this ward, although there were no new admissions with this type of infection. It is suggested that it may have been carried from patient to patient by flies

Aerial Convection of Small-pox.—C Killick Millard<sup>15</sup> has reviewed the evidence for and against the transmission of small-pox by air from small-pox hospitals to the surrounding inhabitants. In 1881 it was noted that there was a graduated intensity of infection among houses in proximity to Fulham Hospital, and

writing in 1886, the late Sir George Buchanan affirmed that similar facts had been established by "a multiplicity of careful and detailed observations in many hospitals in different epidemics". The classic instance is quoted in connexion with the hospital ships at Long Reach on the Kentish shore of the Thames, when a severe epidemic arose in 1901-2 at Purficet, three-quarters of a mile away on the Essex side, with which the hospital ships had no material contact. Similar experiences were said to have occurred during previous epidemics when the hospital ships were in use. There does seem, however, to have been one authenticated occasion when a hospital worker from the ships visited the Essex shore. Millard considers that there is nothing inherently improbable in aerial convection, since the virus of small-pox is exceptionally resistant to desiccation and destruction, and other finely particulate matter is known to be carried long distances by air (See also Medical, Annual, 1940, p. 425.)

References—J Hug, Camb 1944, 43, 352, \* imer I med Sci 1944, 207, 361, \*Ibid 870, \*Ibid 1943, 206, 631, \*Ibid 11, \*Med Innu 1943, 114, \* Imer J Hug 1944, 40, 136, \*Brit med J 1944, 1, 611 \*Ibid 615, \*\*Ibid 616, \*\*Ibid 245, \*\*IJ Bact 1942, 42, 353, \*\*Aerobiol., Washington, D C 1942, 267, \*\*Brit med J 1944, 1, 247, \*\*\*Ibid 628

ALCOHOLISM. (See Social Aspects of Psychiatry.)

### AMENORRHŒA: TREATMENT.

Clifford White, M D., F.R.C P., F.R.C.S., F.R C O.G.

The Two-day Hormone Treatment of Secondary Amenorrhoa. The production of uterms has morrhage by hormones is purely substitution therapy, and hence some think that it is hardly worth attempting. But since many patients are more contented if an occasional loss is brought on by hormones, there are some doctors who use them for this purpose. Hence, further results of the two-day technique introduced by B. Zondek! in 1942 are of interest. He reported 17 cases of secondary amenorrhoa of from 6 months' to 9 years' duration, of which 11 responded favourably to the simultaneous administration of 12.5 mg of progesterone and 2.5 mg of astradol benzoate on two consecutive days. Bleeding from the uterus occurred within 48 to 112 hours after the second injection. Most of the failures were patients who had had secondary amenorrhoa for more than two years.

Rita Finkler<sup>2</sup> reports a further series of 81 patients with secondary amenorrhora diagnosed as being of ovarian or pituitary origin, the duration was from 2 months to 7 years, and the age of the patients between 15½ and 88 years. She drew the 12.5 mg of progesterone and the 2.5 mg, of destradiol benzoate into one syringe and injected them simultaneously into the buttock on 2 successive days. Uterine bleeding resulted in 25 patients (80-6 per cent) after an average interval of 4 days. The ampoules used were Dimenformon Benzoate and Progesterone prepared by Roche-Organon Inc.

Low-dosage Irradiation.—Among others, Mazer and Greenberg have reported 288 patients with amenorrhora treated exclusively by low-dosage X rays applied to the pituitary gland and the ovaries, and L. Heidenbergs followed up 186 of them as a long-term survey. He found 71 per cent of the amenorrhoral and 78 per cent of the oligomenorrhoral patients treated between 1927 and 1987 were still menstruating at normal intervals; also 80 children born of these mothers were physically and mentally normal. One patient received 8 courses of treatment at long intervals and has 3 normal children; it is therefore reasonable to assume that low-dosage irradiation has no deleterious effect on the offspring.

C. Mazer and Rose Greenberg present an analysis of an additional 92 cases of amenorrhoa treated only by X rays. Patients with gross disease such as

hypothyroidism and girls under 17 were excluded. Of the 92 patients, 13 were between 17 and 20, 71 between 21 and 30, and 8 between 30 and 36. For the treatment to be classed as successful the authors require that the patient should menstruate within two months of the treatment and that the improvement should continue for a year. The results of the treatment on the 92 patients are. Ten women had not menstruated for 16 to 72 months (with an average of 32 months), of these, 50 per cent have been menstruating regularly for 1 to 5 years (average 3 years). Twelve women had menstruated only once in 6 months before treatment, of these, 66 per cent have been menstruating normally for an average of 2½ years. Of 68 women who had menstruated once in 2-4 months before treatment, 76-5 per cent have menstruated normally for an average of 2½ years since treatment. A second course of irradiation was given to 10 patients who had shown some improvement after the first course, but only 3 of the 10 obtained a normal menstrual rhythm

Many of the patients who were treated by irradiation had previously had organotherapy which had failed

The technique employed was the Edeiken method,<sup>5</sup> but if bad results are to be avoided it is essential that the treatment should be given by a very highly skilled radiotherapist—it is definitely not a method of treatment to be used by any but the most expert

REFERENCS — J Amer med Ass 1942, 118, 705, 2Amer J Obstet Gynec 1944, 48, 26, 3Ibid 1943, 45, 971, 4Ibid 46, 648, 4Ibid 1933, 25, 511

#### AMCEBIC DYSENTERY.

Sir Philip Manson-Bahr, CMG, DSO, MD, F.RCP

A Westphal<sup>1</sup> in 1937 put forward the view that in man *E histolytica* exists normally as a harmless organism (minuta form) in the lumen of the gut, and in this stage forms cysts which appear in the fæces. The minuta stage is nourished by osmosis and phagocytosis, whilst the nutriment is digested by the amœba, and at this stage it commences to excrete a proteolytic ferment and may become a pathogen, but the extent to which invasion of the bowel wall takes place depends upon the tissue-resistance of the host. The breakdown of resistance may in the first instance be due to bacterial spoiling, damage to the cells, and functional disturbance. Subsequent to formation of amœbic lesions, secondary alteration of the intestinal flora takes place, especially so in tropical and subtropical climates. Then the amæba is no longer able to form cysts.

The following is the suggested sequence of events (1) An acute bacterial disease (? bacillary dysentery), in which the amoeba plays a small part, (2) Pure amoebic dysentery, in which bacteria play a transient part, (3) Chronic dysentery, which from a chemotherapeutic angle is more difficult to cure

In experiments made by ingestion of cultures of  $Bact\ Flexneri$  in individuals with harmless infections of E histolytica cysts (carrier state) Westphal<sup>2</sup> was able to produce, he claims, acute attacks of amorbic dysentery with large tissue-invading trophozoites

Amoebic Dysentery in North Africa and its Prevention.—Now Horster,<sup>3</sup> a German sanitary medical officer, discusses amoebic dysentery as it occurred amongst the German troops in the Libyan campaign. He is a disciple of Westphal in adopting the view that *E. histolytica* is in the first place a harmless commensal in the intestinal tract. The commonest cause of such injury is bacillary dysentery, against which the newly arrived, unaccustomed troops have no immunity, and whereas these bacterial disorders of the intestine are common amongst newly arrived troops, they are rare in the indigenous population, or troops which have been stationed for a considerable time in

the country In consequence amorbic dysentery becomes the commonest type amongst local inhabitants and seasoned troops

In 1941, of admissions to hospital for intestinal disorders 25 per cent were found to have *E. histolytica* infection, though in only a proportion were the amoebæ the cause of the trouble.

If follows, therefore, that the easiest method of preventing ancebic dysentery is to take every precaution against bacterial infections

REFLRENCI 4 - 1 irch f Schiffs - u. Trop - Hig. 1937, 41, 262, \*Disch. Trop Z. 1912, 46, 258, \*Ibid 1913, 47, 299

### AMPUTATIONS.

T. P McMurray, F.R C.S.

In a review of the advantages and disadvantages of the many types of amputations which are commonly performed, Perkins! begins his article with the following instructive and arresting paragraph. "Gone are the days when the surgeon's word was law, at least in regard to amputations. In the past surgeons have amputated where and how they liked, each one selecting a fresh site with flaps of his own invention." This attitude of complete detachment from the problems of the artificial limb maker has been on the whole abandoned, and it is realized that at the present time the advice of the instrument maker must be considered very carefully, and due consideration given to the reasons he advances for demanding a particular type of amputation, and a particular level at which a limb should be removed

In discussing the method of amputation, Perkins stresses the importance of having an uninfected field through which the amputation can be performed Realizing that an amputation performed to save life may be only a preliminary measure, which is often followed by a second amoutation performed under more favourable conditions, he states that under certain conditions it is advisable to perform two amputations, the primary or provisional removal designed to produce a surgical field free from infection. In this primary amputation it is not always necessary to go above the site of infection, as by removal of mildly infected tissues a stump may be left so short that the function of a neighbouring healthy joint may be entirely lost. By amoutating through instead of above the infection the mobility and power of a neighbouring joint can often be retained at the final amputation, as, for example, in the case of a grossly infected ununited fracture of the tibia, where a provisional amputation through the site of fracture often heals in a few weeks. Difficulty is often experienced in deciding the correct time for the performance of the secondary or final amputation. Ideally it should not be attempted unless primary healing can be guaranteed, this is not always possible and a certain amount of risk may be taken, as, for instance, when a small chronic indolent ulcer is present over the end of the stump

There is now fairly general agreement as to the ideal sites of amputation at which the functional capacity of the limb is most fully retained, while ample room is allowed to the limb maker to deal with the problems of joint mechanics. The older surgeons, on the whole, held the behef that the longer the stump the more powerful must be the control over the artificial limb, and therefore that every amputation should be so planned as to leave as much of the limb as possible. This attitude has been very drastically revised in view of the experience gained through observation of the vast numbers of amputees of the last war. These observations were directed chiefly to two points, first, the freedom of application of the artificial limbs and their rather complicated mechanism, and secondly, the effects of pressure from the limbs and the response of the skin to alterations of circulation.

Amputations of the leg should be carried out at a point between 5 and 7 in.

below the knee-joint, if the stump is longer than this it tends to develop circulatory disturbances, especially in the winter, while great difficulty is experienced in providing an artificial limb similar in shape to the normal leg. Again, amputation through the thigh should, if possible, be performed through the femur at least 11 in below the tip of the trochanter. At this level sufficient of the insertion of the adductor muscles is retained to gain control of the limb, while adequate space is allowed below the stump for the fitting of the knee mechanism. In the arm and forearm amputation the limb maker requires a space of at least 3 in in which to fit the mechanism of the elbow or wrist, while as regards minimum lengths there must be at least 1 in of ulna beyond the prominence formed by the bireps tendon when the elbow is flexed to a right angle. In the ideal stump.—

- 1 The scar is not exposed to pressure
- 2 The scar is not adherent
- 3 The skin is not infolded
- 4 There is no redundant soft tissue
- 5. There is no protruding spur of bone
- 6 The stump is not tender
- 7 The wound has healed by first intention

The great point of disagreement between surgeons who have special experience in this type of surgery is in regard to the value of the Syme amputation Basing their judgement largely on the proportion of patients in whom reamputation was necessary, the limb-fitting surgeons in England are of the opinion that it is never advisable to perform a Syme amputation. They claim that an amputation performed through the site of election enables the patient to do anything which can be done by one in whom the lower level has been chosen. They claim also that because of the thickness of the stump it is impossible to fit any form of prosthesis which cannot be instantly recognized as an artificial limb.

The Canadian and the Edinburgh Schools of surgery claim that a Syme amputation correctly performed leaves an excellent stump, which is much more useful to a working man than the shorter lever provided by the ordinary below-knee amputation. They stress also that even without the artificial foot the patient can get about freely and can carry on any type of heavy manual labour, but they acknowledge that on account of the appearance produced by the prosthesis it is never advisable to perform a Syme amputation in a woman.

REFERENCE -1 Brit J Surg 1944, 31, 877

### AMPUTATIONS, PAIN AFTER.

Lambert Rogers, M Sc. F.R C S

Wars always produce a number of painful amputation stumps, and already there are indications that the present conflict is no exception. These distressing conditions are likely to be a problem in rehabilitation for some time to come. Commander J. C. White¹ of the U.S. Navy reviews our knowledge of the treatment of these painful amputation stumps and of the curious condition of persistent phantom limb. It is important to reject methods of treatment which have proved to be ineffective or quite futile and restrict our attack to those which are promising. Incapacitating pain after amputation may be due to irritation of end-bulb neuromas in the stump or to a phantom limb, the postural and painful sensations associated with which have become established in the post-central cerebral cortex. Surgical procedures which in the light of past experience are to be condemned in such cases are repeated excision of neuromas, neurectomies, re-amputations at higher levels, and resections of the posterior spinal roots. Those likely to be effective are

(1) Single resection of a neuroma if this is definitely tender and if the pain can be relieved by infiltration with novocain; (2) Sympathectomy; or (8) White believes that the peculiar Chordotomy (spino-thalamic tractotomy). pain and unpleasant postural sensations of the phantom limb will occasionally respond to sympathectomy or chordotomy, especially if the operation is performed relatively early, but such procedures fail when the patient's personality has started to deteriorate from prolonged suffering. In such cases surgical attack on the higher cerebral centres may be effective. These comprise resection of the contralateral post-central sensory convolution from which the phantom sensations appear to be projected, and possibly in some cases bilateral division of the frontal association fibres (leucotomy), a procedure which White suggests may be effective by freeing the patient from intense introspection and anxiety [It is well to remark that neither of these procedures has as yet been given extensive trial in these cases; isolated instances in which the result has been promising are noted, however, in this paper. L. C. R.1

REFERENCE -1J Imer med 1ss 1944, 124, 1030

# ANÆMIA: CONCENTRATED RED-CELL SUSPENSIONS IN TREATMENT. Stanley Davidson, M.D., F.R.C.P. H. W. Fullerton, M.D., M.R.C.P.

C. K. Murray, D. E. Hale, and C. M. Shaar¹ estimate that about one-half of the patients needing blood transfusion in a large general hospital probably need only red cells. Therefore they recommend the use of concentrated red-cell suspensions unless there is an indication for the transfusion of plasma as well. The saving in material which may be achieved by this means is very great, since, in most centres preparing blood-plasma, large quantities of the red cells are being discarded. The main condition in which transfusion of red cells is likely to be as beneficial as the use of whole blood is chronic anemia, where the object desired is merely an increase in the oxygen-carrying capacity of the blood with as little alteration in its volume as possible. Indeed, an increase in the blood volume in chronic anemia carries with it the danger of pulmonary cedema if the cardiac reserve is low.

The technique of Murray, Hale, and Shaar is as follows: After the plasma has been removed from a bottle, the aspirating needle is plunged to the bottom of the red-cell layer and 200 c.c. of cells are drawn over by a vacuum into a sterile 300-c.c. bottle containing 100 c.c. of 5 per cent dextrose in isotonic saline. The buffy coat is left behind. The cells are 1 to 2 days old when aspirated, and are stored in the refrigerator at 2-5° C. for not more than 3 days. If they have not been used by this time they are discarded. They found no difficulty in administration, and in a series of 116 transfusions there were only two reactions.

- R S Evans<sup>2</sup> also emphasizes the advantages of red-cell suspensions over whole blood in the transfusion treatment of chronic anæmia. He used simply an even mixture of the red cells and the small amount of plasma left after the bulk of the plasma had been removed. He found no difficulty in administering these concentrated suspensions so long as the head of pressure during transfusion was greater than in the case of whole blood.
- H. L. Alt, S G. Taylor, D. L Custis, and F. D. Bernard<sup>\*</sup> have used a technique which is similar except that they added a little saline to the red-cell suspensions to facilitate the flow. In a series of 227 transfusions of this type in 100 patients with various kinds of anæmia they found that the percentage of reactions was less than would have been expected if whole blood had been used. Similar findings are reported by W B. Cooksey and W. H. Horwitz.<sup>4</sup>

The reviewers can endorse these favourable reports. They would draw particular attention to the dangers of ordinary blood transfusion in those cases of pernicious anæmia who are so ill on admission to hospital that they are unlikely to survive the 4 or 5 days which must elapse before any response to liver extract therapy occurs. In such cases the weakened myocardium is often unable to withstand a sudden increase in blood volume. Therefore the transfusion, perhaps repeated, of small volumes of concentrated red-cell suspensions is much to be preferred to the use of whole blood. They have also been impressed by the repeated use of concentrated red-cell suspensions in the preparation of cases of severe hæmolytic anæmia for splenectomy. Where it is desired to raise the hæmoglobin level fairly rapidly from about 20 to 70 per cent in such cases, the total volume which it is necessary to transfuse is reduced to approximately one-half by the use of concentrated red-cell suspensions

REFERENCES — J Amer med Ass 1943, 122, 1065, \*Ibid 793, \*Surg Gynec Obstet 1944, 78, 191, \*J, Amer med Ass 1944, 124, 961

### ANÆMIA, HYPOCHROMIC.

Stanley Davidson, MD, FR.CP. HW Fullerton, MD, MR.CP

Nutritional Iron-deficiency in War-time,—The effect of the changes in diet resulting from the restrictions imposed during this war, on the incidence of hypochromic aniemia of nutritional origin, has been the subject of two recent papers.

L S P Davidson and his colleagues in Edinburgh conducted large-scale surveys of the hæmoglobin levels of different sections of the population during the early stages of the war. The main results were reviewed in the Medical Annual for 1944 (pp. 22–23). Now they have repeated hæmoglobin estimations in many of the individuals included in their earlier surveys and some striking differences have been found. In September, 1942, 347 children attending an Edinburgh school had a mean hæmoglobin level of 82.9 per cent (Haldane), in June, 1944, the figure for 237 of these was 87.5 per cent. In July, 1942, 96 children attending another school had a mean hæmoglobin level of 77.5 per cent, the figure for 64 of these re-examined in June, 1944, was 90.8 per cent. In July, 1942, and June, 1944, the mean hæmoglobin levels of pregnant women in the second trimester attending the same antenatal clinic were 77 per cent and 86.8 per cent respectively

H W Fullerton, M I Mair, and P Unsworth<sup>2</sup> made hæmoglobin estimations of 1177 individuals belonging to the poor classes in Aberdeen during 1948 and early in 1944. The results were compared with a similar survey reported in 1935. The incidence of anæmia in young children (below 7 years) and in pregnant women was considerably less in 1943 than in 1935. Among older children and adolescent and adult males no significant change was found. The mean hæmoglobin level of girls between the ages of 15 and 19 years was considerable lower in 1943 than in 1935, the figures being 81 3 per cent and 94 4 per cent respectively

Therefore, with the exception of the last-mentioned group, all the data show that the common type of hypochromic anæmia of nutritional origin has become less since war began. The authors of both communications suggest that the introduction of national wheatmeal flour has been an important factor in bringing about the improvement. Its iron content is moré than double that of pre-war white flour and it contains more vitamin B.

Ascorbic Acid as an Adjuvant to Iron Therapy.—Recently there has been an increasing tendency to prescribe ascorbic acid in addition to iron in the treatment of hypochromic anæmia. On general grounds there is something to be

said for this practice, because nutritional hypochromic anæmia is particularly common among women of the poor classes whose diets are low both in vitamin C and iron But it is not at all clear what part, if any, a deficiency of vitamin C plays in the development of this type of anemia, and it has been shown by the reviewers' that iron alone in large doses (ferrous sulphate 9 to 12 gr., or iron and ammonium citrate 90 gr daily) restores the hamoglobin level to normal in practically all cases of nutritional iron deficiency anamia Moreover, it has been demonstrated recently by L. S. P Davidson and G. M. M. Donaldson4 that while a significant rise in the hæmoglobin levels of numerical-school children in Edinburgh occurred after treatment with 3 gr of ferrous sulphate daily for 5 days a week during 3 months, a daily supplement of 25 mg of ascorbic acid was without effect. New light has been thrown on the problem by J F Powell 5 In a small series of women with chronic hypochronic anatma she has shown that a small dose of iron (71 gr iron and aminonium citrate daily) produced little or no effect on the level of serum iron or on hamoglobin regeneration, but the same dose was effective when 500 mg ascorbic acid daily was given in addition. This finding is interpreted as indicating that ascorbic acid facilitates the absorption of iron. Iron is presumably absorbed in the ferrous state, and this explains why relatively small doses of ferrous salts are as effective as very much greater amounts of the ferric salts or scale preparations. Ascorbic acid acts as a powerful reducing agent and therefore may facilitate the conversion of iron to the ferrous state. Powell's work is interesting, but it should not alter the present practice of using large doses of iron in the treatment of hypochromic anaemia. However, if such therapy seems to be ineffective or produces hamoglobin regeneration only slowly, then there is a definite indication for supplementing iron with ascorbic acid

Releasing -4Bril, med J. 1944, 2, 333., \*Ibid 373., \*Edinb med J. 1938, 45, 193., \*Bril med J. 1944, 1, 76., \*Quart J. Med 1944, 13, 19

#### ANÆMIA, PERNICIOUS.

Stanley Davidson, M.D., F.R.C.P. H. W. Fullerton, M.D., M.R.C.P.

X-ray Investigation of the Gall-bladder in Pernicious Ansemia. T. Lindqvist and G. Sohrnel report a series of cases of permicious anaemia in relapse which showed no filling of the gall-bladder on X-ray investigation after oral administration of tetralodophenolphthalem After restoration of the blood level a normal picture of the gall-bladder was obtained Obviously in these cases the original abnormality could not have been due to obstruction of the biliary system or disease of the wall of the gall-bladder, nor was it due to ansema per se, since a normal gall-bladder picture was obtained in severe cases of anæmia other than permicious anæmia. The authors accordingly believe that the cause of the failure to demonstrate the gall-bladder lay in hepatic dysfunction. The importance of these observations lies in the fact that cholecystitis and cholelithiasis are not infrequent complications of pernicious The doctor should remember that the failure to visualize the gallbladder in pernicious anæmia must be accepted with caution as a diagnostic sign unless the blood-picture is approximately normal.

Relapses in Pernicious Anæmia.—In 54 cases of pernicious anæmia 88 relapses due to the omission of maintenance treatment were observed by S. O. Schwartz and H. Legere.<sup>2</sup> The interval between cessation of treatment and relapse varied very widely and could not be correlated with age, sex, the total amount of treatment which had been given, or the dosage which had been found necessary for proper maintenance. It is suggested that these findings may be partly explained by individual variations in the ingestion of 'extrinsic' factor and in the secretion of 'intrinsic' factor, the latter occurring perhaps

in a cyclic manner. Since individual patients may remain well without treatment for periods of one, two, or three years, it follows that caution must be exercised in making any general statement about maintenance doses. Claims previously made in favour of the massive dose (depot) method of maintenance therapy obviously require reconsideration in the light of the findings noted above.

Sensitivity to Liver Extract.—J G McSorley and L S P Davidson<sup>3</sup> discuss the not uncommon occurrence of allergic reactions to intramuscular liver therapy. their alarming nature on occasion, and the practicability of desensitization. During the past ten years the authors have had under their care 40 patients with allergic reactions, of which 17 were so severe as to require hospitalization and The authors describe the clinical manifestations and discuss desensitization the value of skin tests They divide their cases into two classes with mild symptoms, and (2) those with severe constitutional reactions mild cases may be controlled by the injection of adrenaline (3-5 min ) immediately prior to the injection of the liver extract. In other mild cases satisfactory results may be obtained by reducing the quantity of liver extract injected to one-quarter or one-half of the dose which produced the reaction, and by reducing the periods between injections by three-quarters or one-half After some weeks the dosage and the intervals between injections are gradually increased to the desired maintenance level Severe cases with dangerous reactions must be desensitized or given oral treatment. The former method is recommended provided desensitization is carried out by persons experienced in its technique and dangers The method of desensitization used successfully by the authors in 17 severe cases is described in detail. Desensitization was achieved in approximately five hours by giving increasing amounts of liver extract together with adrenaline at half-hourly intervals

Refractory Megaloblastic Anæmias.—L J Davis, L S P Davidson, D Riding, and G E Shaw4 draw attention to the great therapeutic activity of papain digest of liver given orally in the form of a dry powder to classical cases of pernicious anæmia Two teaspoonfuls of this powder derived from 1 to or of whole liver given daily produce an excellent hæmatological and clinical response Since the appearance of this paper, Davis and Davidson<sup>5</sup> have published an account of the treatment with proteolysed liver of a series of cases of extremely severe megaloblastic aniemia which were refractory to all the usual forms of hæmatinic therapy including the parenteral injections of Proteolysed liver produced a dramatic life-saving potent liver extracts Some of their cases occurred during pregnancy and the puerperium, others were of unknown aetiology It is obvious, therefore, that in this papain digest of liver, and presumably in whole liver, there is present some hæmatopoietic factor required for the transformation of megaloblastic bone-marrow which is absent in the chemically purified liver extracts given by the parenteral The nature of this factor is as yet unknown

Achlorhydria and Replacement Therapy with Dilute Hydrochloric Acid.—In almost every standard text-book of medicine will be found the recommendation that gastro-intestinal symptoms attributable to achlorhydria are effectively treated by the oral administration of from 1 to 2 drachms (2–4 c c.) of dilute hydrochloric acid (BP) given thrice daily. The late Sir Arthur Hurst repeatedly stressed the value of this form of replacement therapy, and recommended that the acid should be mixed with orangeade and sipped throughout the course of meals. The reviewers have frequently pointed out to both postgraduate and undergraduate students the difficulty of understanding how such replacement therapy, particularly in the dosage recommended, could produce the results claimed. Their arguments were based on two propositions

(1) Since many hundreds of thousands of people in Great Britain have achierhydria and yet have no gastro-intestinal symptoms, it is difficult to accept a deficiency of hydrochloric acid as the cause of such symptoms when they occur in association with achlorhydria This aspect is well illustrated in the disease pernicious anæmia, in which the patient has achlorhydria prior to the disease and subsequent to its complete control with liver therapy, and yet it is only during the relapse stage that gastro-intestinal symptoms regularly occur Moreover, since a dramatic return of appetite and cessation of dyspepsia and diarrhœa usually result within 3-5 days of the injection of a potent liver extract, it is difficult to believe that the continuing achlorhydria was responsible for the previous alimentary symptoms In addition, since the blood level is not significantly altered during this period, the symptoms cannot be caused by the anæmia per se. (2) If hydrochloric acid is of value, its beneficial therapeutic effects must result from the lowering of the hydrogen ion concentration of the gastric contents This is true whether the benefits claimed are attributable to improvement of peptic digestion, alteration of gastric tone, or an antiseptic action on the gastric bacterial flora. It should be pointed out that even if the pH were lowered to a point which would be effective in these respects, the duration of action would cover a period of three or four hours, while for the remaining twenty hours of the day the achlorhydric state would continue studies of A E Koehler and E Windsors suggest that the usual pharmacological dose of dilute hydrochloric acid is quite ineffective in securing the required acidity even for short periods These authors state that the addition of 1-2 drachms (2-4 cc) of dilute hydrochloric acid to a representative meal in vitro had relatively little effect on the pH of the meal owing to the buffer action of the food They conclude that the amount of dilute hydrochloric acid required to bring the pH of the meal to a normal post-meal range at which peptic activation occurs, and to maintain it during the digestive phase, would be from 10 to 20 times the pharmacological dose. They estimate that the amount of hydrochloric acid secreted by the stomach for an average meal must be in excess of 104 c c of normal acid or 35-40 c c of dilute hydrochloric acid (BP).

It is obvious, therefore, that it is impossible even to approach by substitution therapy the quantity of acid secreted by the stomach. The reviewers have not prescribed hydrochloric acid routinely for the gastro-intestinal symptoms of pernicious anæmia for many years, both because of the theoretical considerations discussed above and because they were not satisfied with the clinical effects produced They are glad, therefore, to find that their views are shared by no less an authority on pernicious anæmia than Professor C. C Sturgis<sup>7</sup>, of Ann Arbor, USA The question therefore must be faced whether authors of standard text-books should continue to recommend the administration of hydrochloric acid for the gastro-intestinal symptoms which may accompany the achlorhydric state Are the opinions of many senior and famous clinicians to be discarded on the grounds that their advice was based on clinical impressions alone and without adequate investigations to control the importance of the psychological factor and the natural tendency to spontaneous recovery? Or are we to believe that the necessary controls have been carried out and that replacement therapy with hydrochloric acid is, in fact, effective even if our knowledge is inadequate of how such effects are produced? An answer can only be given if the problem is re-investigated in a carefully controlled scientific manner.

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ANÆMIAS, HÆMOLYTIC. (See also ERYTHROBLASTOSIS FŒTALIS)
Stanley Davidson, M.D., F.R.C.P.
H. W. Fullerton, M.D., M.R.C.P.

1. Acquired Hæmolytic Anæmia.—V R Mason¹ reports 12 cases of acquired hæmolytic anæmia The ages of the patients ranged from 15 to 67 years, and 10 of the 12 patients were females. The clinical course varied, in some cases it was acute, in others subacute, while in others again it was chronic. Splenomegaly was constant. The blood-picture was characterized by the features of profound anæmia with numerous macrocytic reticulocytes and spherocytes. The colour index was at or above unity. Increased red-cell fragility in hypotonic saline was present in only a minority of the cases. Hæmoglobinuria was a feature in none, nor was the presence of autohæmolysins or isohæmolysins demonstrated.

Splenectomy was performed in 9 of the cases, with subsequent recovery or improvement in 5

The author reviews at length the conclusions of certain other workers on this type of hæmolytic anæmia and discusses the possible aetiological factors. He concludes that the disease is neither hereditary nor congenital and that its aetiology is unknown

2. Symptomatic Hæmolytic Anæmia —L J Davis² reviews the literature and discusses the diagnostic criteria and pathogenesis of hæmolytic anæmia arising during the course of morbid processes such as carcinomatosis, leukæmias, and reticulesis Clinical, hæmatological, and pathological data are presented of 4 cases recently studied, in which the underlying pathological conditions were respectively carcinoma of the tail of the pancreas, reticulosis (2 cases), and subleukæmic myeloid leukæmia

In none of these cases did the blood-picture resemble that of congenital acholuric jaundice, since inicrospherocytosis and increased red-cell fragility in hypotonic saline were absent, and macrocytosis was evident in all. The diagnosis of excessive hæmolysis was based upon the persistence of high reticulocyte counts and upon evidence of hyperbilirubinæmia, together with excessive excretion of urobilinogen

All the cases proved fatal, but it is suggested that, in general, treatment should be based on the employment of whatever therapeutic measures are appropriate for the underlying pathological condition and on the transfusion of carefully matched blood. Whether splenectomy should also be performed in certain selected cases remains an open question

#### 3. Hæmoglobinæmia and Hæmoglobinuria.-

a. Following Burns.—Hæmoglobinuma has for many years been recognized as an infrequent complication of severe and extensive burns. Shu Chu Shen, T. H. Ham, and E. A. Fleming have studied the mechanism of this phenomenon Gross hæmoglobinuma occurred in 9 cases and minimal hæmoglobinuma in 2 among 40 cases of second and third degree thermal burns involving 15 to 65 per cent of the body area

The maximum excretion of hæmoglobin occurred during the first twelve to twenty-four hours, and then decreased rapidly Hæmoglobinæmia was observed in 8 of the cases, and in one case in which spectroscopic examination of the plasma was performed methæmalbumin was detected Increased red-cell fragility in hypotonic saline was evident in 7 cases. In some of the cases films of the peripheral blood showed fragmentation, budding, and microspherocytosis. Similar changes in morphology and fragility occurred in human and dogs' blood on heating in vitro. The injection into normal dogs of dogs' blood that had been heated, resulted in hæmoglobinæmia and hæmoglobinuma co-incident with the disappearance of the abnormal cells from the peripheral circulation

The authors conclude that hæmoglobinuria following thermal burns may result directly from heating of blood at the site of the burn with consequent damage or destruction of erythrocytes

b Following Severe Exercise—D R Gilligan, M D Altschule, and E M Katersky<sup>4</sup> studied the effect of physical exertion on the production of intravascular hæmolysis and hæmoglobinuria in apparently healthy individuals. Ten out of twenty-two cross-country runners from 17 to 65 years of age developed hæmoglobinuria after races of 26–51 miles, and eighteen out of twenty-two after a race of 262 miles. Hæmoglobinuria was found in one person on three separate occasions after running 5 miles, and in four out of twenty-two of the Marathon runners. Both hæmoglobinæmia and hæmoglobinuria disappeared rapidly after cessation of exercise

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#### ANÆSTHESIA AND ANALGESIA. C Langton Hewer, M B, B.S, D A

#### INHALATION ANÆSTHESIA

Nitrous Oxide.—If it is desired to use ether as the main anæsthetic agent with a Boyle's apparatus, an oxygen injector unit described by J Ives¹ can be interposed between the flow-meter and the trichlorethylene bottle as shown in Fig 3 Induction of anæsthesia is effected in the usual way and then

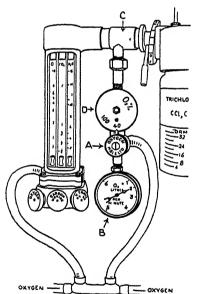


Fig 3—Ives' injector economiser, A, Injector oxygen control, B, Aneroid manometer C, Streamlining tube, D, Injector control disc (By kind permission of 'The Lancet')

the flow-meter valves are closed and the oxygen injector control is opened until the manometer shows a rate of flow of from 1½ to 2 litres per minute Atmospheric air is 'entrained' so that the resulting mixture will be about 40 per cent oxygen and 60 per cent air, which vaporizes the ether Considerable saving in nitrous oxide can thus be effected if it is considered advisable to use ether as the sole anæsthetic

Di-ethyl Ether.—P H Blackiston<sup>a</sup> has pointed out that if the Oxford ether vaporizer No 1 is used in tropical climates it may be necessary to fill it with cold water in order to keep the internal temperature between the required limits Neglect of this precaution may cause boiling of the ether so that the apparatus will function like the Oxford vaporizer No 2

D Williams and W H Sweet<sup>3</sup> have invoked the aid of electro-encephalography in trying to solve the problem of the causation of ether convulsions A series of 22 patients who had suffered from these seizures was subsequently investigated and three-quarters showed a persisting abnormality of cortical

rhythm indistinguishable from latent epilepsy. It is suggested that the known factors occurring during anæsthesia can be regarded as precipitants

of an attack which appears to be identical with an epileptic fit. Various arguments can be ranged against this theory, but ether would appear to be the most likely agent to cause such a convulsion, as it is known that during the induction of anæsthesia it produces persistent high-voltage cortical discharges

Isopropenyl-vmyl Ether.—This compound, also known as propethylene,

ether Its specific gravity is 0.786, its boiling-point is 55° C, and it has a characteristic smell resembling that of cyclopropane. It is less volatile than di-ethyl ether, but E H Davis and J C Krantz<sup>4</sup> have found it to be a more potent anæsthetic in animals and in man. From preliminary trials these workers consider that it may be of practical use

Cyclopropane has proved very valuable for anæsthetizing shocked air-raid and battle casualties, and R Binning<sup>5</sup> has shown that in the light of experience in the North African campaign, there is no reason why this agent should not be used right up in the front line of swiftly-moving armies

Trichlorethylene.—The popularity of this agent has continued to increase in Great Britain and there are now few hospitals where it is not in use G E. H Enderby<sup>6</sup> has contributed a useful review of the various applications of the drug, and has pointed out that most of its alleged disadvantages are due to the ignorance of the administrator. For example, it is useless to replace the chloroform in a Boyle's apparatus with trichlorethylene and to expect similar signs with the latter agent. The drug is most useful as a maintenance agent, and no attempt should be made to 'push' it with a view to securing absolute relavation. Tachypnica and other signs of overdosage will result if this advice is ignored.

M. McClclland? has shown that under certain circumstances it is possible for soda-lime to decompose trichlorethylene into dichloracetylene, a toxic product which can probably cause nerve palsies. S Carden<sup>8</sup> has pointed out that this decomposition is much more likely to occur with a particular brand of unsuitable soda-lime which contains an excess of sodium hydroxide and becomes extremely hot. Using the same absorbent material for subsequent administrations also increases the hability to decomposition. In order to be on the safe side it is well to eschew the CO<sub>2</sub>-absorption technique completely when using trichlorethylene.

C G. Barnes and J Ives<sup>8</sup> have investigated the electrocardiographic changes which may occur during trichlorethylene anæsthesia. As with other inhalation agents, a great variety of changes were observed, but these seem of little clinical importance with the possible exception of multifocal ventricular tachycardia. In the case of chloroform it is known that this arrhythmia can be a precursor of ventricular fibrillation—e.g., if adrenaline be injected—and this is one of the mechanisms of the primary cardiac failure which is such a tragic possibility with chloroform. In the case of cyclopropane and trichlorethylene, however, although multifocal ventricular tachycardia has been demonstrated in about 10 per cent of administrations of each drug, primary cardiac failure is exceedingly rare, so that it would be unwise to attach too much importance to this change in the electrocardiogram.

Explosions.—The subject of explosions not due to enemy action is a perennial one, and B A. Greene<sup>10</sup> records 10 such cases mostly occurring during screening with obsolete X-ray apparatus C. F Hadfield<sup>11</sup> has pointed out that in such circumstances the use of trichlorethylene as the anaesthetic agent is

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probably entirely safe, although at high temperatures mixtures of the drug with oxygen may under some conditions ignite

#### Intravenous Anæsthesia

Tissue Sloughing.—Some intravenous anæsthetics—especially strong solutions of pentothal sodium—tend to cause sloughing if they are accidentally deposited outside the vein C K Elder and E M Harrison<sup>12</sup> have shown (in rabbits) that sloughing can be prevented by the immediate infiltration of the affected area with 1 per cent procaine in normal saline mechanism is vasodilatation counteracting the vasospasm. This prophylactic treatment would seem to be well worth trying in man

Sneezing, which sometimes occurs during an ophthalmic operation performed under intravenous anæsthesia, may be a very serious complication, and appears to be caused in part by instilled solutions passing down the nasolacrimal duct and irritating the nasal mucosa C J Thomas<sup>13</sup> suggests that preliminary cocamization of each eye may prevent this reflex

#### GENERAL ANALGESIA

Nitrous Oxide.—Up till now narco-analysis has usually been practised with one or other of the barbiturates C H Rogerson<sup>14</sup> reports successful results using general analgesia induced by nitrous oxide and air in a Minnitt's apparatus



Fig 4—Inhaler (Hill's) for producing self-administered general analgesia in dentistry During painful drillings, etc., the patient squeezes the rubber hand-bulb which forces air through the vaporizer, where it picks up trichlorethylene vapour and delivers it to the nose-piece

Trichlorethylene.—General analgesia produced by trichlorethylene is being used increasingly in dental work and has been found extremely effective for painful drillings B. Hill $^{15}$  has designed a simple but efficient 'blow-through' bottle connected by tubing to a nose-piece of analgesia himself by squeezing the rubber bulb as shown in Figs 4–6.

Intravenous Procaine.—Procaine and similar drugs have been introduced occasionally into arteries and veins with tourniquet control in order to produce analgesia in a limb J S. Lundy<sup>16</sup> has shown that a slow drip infusion of 0 2 per cent procaine in 5 to 10 per cent glucose-saline into the general circulation

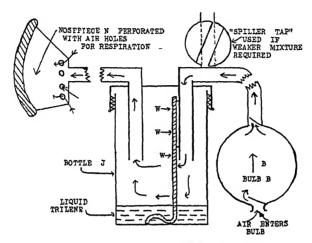


Fig. 5.- Section through Hill's trichlorethylene inhaler to show mechanism

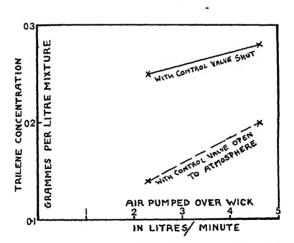


Fig. 6. Vapour concentration of trichlorethylene in air, using Hill's vaporizer (Figs. 4-6 by kind permussion of the 'Proceedings of the Royal Society of Medicine'.)

will produce sufficient general analgesia to relieve the intense pruritus of jaundice R. A. Gordon<sup>17</sup> has employed the method for painful burn dressings, and it would appear that there is scope for considerable development in the technique.

#### LOCAL ANALGESIA

Procame and the Sulphonamides.—It is now generally known that procame inhibits the action of the sulphonamides, but the disastrous results of ignoring this fact are not always recognized. If local analgesia must be used for patients requiring sulphonamide therapy, drugs other than p-aminobenzous acid derivatives must be used or severe infection along the needle tracks may occur

The following table compiled by O L Peterson and M Finland<sup>18</sup> strikingly illustrates the inhibiting effect of procaine *in vivo* on the bacteriostatic action of sulphathiazole added to human serum

Sulphathiazole	ORGANISMS PER C C AFTER 48 HOURS'			
Added	GROWTH IN SERUM OBTAINED			
mg /c c	Before Procame	After Procame*		
0	8,450,000,000	2,200,000,000		
5	900,000,000	1,490,000,000		
10	11,000,000	2,780,000,000		
15	950,000	2,100,000,000		
25	97,000	1,610,000,000		

<sup>\*</sup>Inoculum 8800 organisms per c c serum Concentration of procaine per 100 c c serum—17 mg free—3 3 mg total This serum was obtained from blood drawn 30 minutes after the subcutaneous injection of 15 g procaine (without adrenaline)

#### SPINAL ANALGESIA

Control of Blood-pressure.—The cause of the fall in blood-pressure which

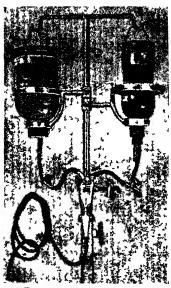


Fig 7—Double drip apparatus for blood and adrenaline salme (Reproduced by kind permission of the 'The Lancet')

invariably occurs during high spinal analgesia has been the subject of much speculation, one popular theory being that the adrenals are paralysed and that insufficient adrenaline is available for the proper functioning of the cardiovascular reflexes Acting on this supposition, F Evans<sup>19</sup> has tried out a continuous adrenaline drip infusion during spinal analgesia and has found it effective The concentration used is 1-250,000 and the speed of drip 40-60 drops per minute Normal saline supphed in a 'Vacoliter' or 'Sterivac' flask is satisfactory, but if 'home-made' fluid is used, carbon dioxide should be bubbled through to prevent oxidation If blood transfusion is required as well, a double drip (Officer) apparatus can be employed (Fig 7), but it is useless to add the adrenaline direct to the blood One advantage that this method possesses over other analeptics is that cumulative effects do not arise, and if a brachial stethoscope is used, a very accurate control of the blood-pressure can be maintained

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ANÆSTHESIA, CONTINUOUS CAUDAL, IN MIDWIFERY. (See CONTINU-OUS CAUDAL ANÆSTHESIA IN MIDWIFERY)

ANEURYSM, INTRACRANIAL. (See Subarachnoid Hæmorrhage, Spontaneous)

#### ANGINA PECTORIS. (See also CORONARY SCLEROSIS)

William Evans, MD, FR.CP.

Pain in Angina Pectoris.—During an investigation of the clinical aspects of pain in the chest, T R Harrison1 examined 77 patients with angina The pain was felt in the substernal region in only about half the Pain entirely limited to the periapical, axillary, or abdominal natients regions did not occur in any case The duration of the pain was usually a few minutes only, rarely longer than half an hour, and in none did it last for only a few seconds Pain of great intensity was exceptional, the discomfort being mild or minimal in more than half the patients In nearly half the discomfort was constrictive or heavy in character Frequently the pain was of an aching quality, burning discomfort was occasionally found, while lancinating pain was only encountered once. In addition to the generally recognized factors inducing pain, namely, exertion, eating, emotion, and cold, Harrison stated that the recumbent posture and hypoglycæmia were also common precipitating causes of the attacks. Pain induced by the sitting or standing position or aggravated by breathing, coughing, or swallowing can usually with safety be ascribed to disorders other than angina pectoris In the diagnosis of angina pectoris the most important features were history of relationship to effort, the short duration of the pain, and the demonstration that the amount of muscular effort required to induce the pain is increased by nitroglycerin Harrison also found that a large percentage of patients with angina pectoris also suffered from chest pain due to other dis-Such disorders may be related to angina pectoris as in the case of cardiac infarction, or unrelated to it as in the case of gall-bladder disease. hiatal hernia, or esophageal spasm

Treatment by Nicotune Acid.—Since improvement in patients with angina pectoris had been reported from the use of nicotinic acid, W. Stokes² tested the drug in a series of cases under controlled conditions. He found that changes in the electrocardiogram of cardiac ischæmia in man following the administration of the drug suggested that it could improve coronary bloodflow, but this only resulted from a dosage large enough to produce peripheral flushing which was in itself an uncertain and unpleasant effect. In the controlled clinical trial no improvement resulted from its oral administration in moderate dosage either in the prevention or relief of anginal attacks, so that it had no claim to its routine use in this complaint. Once again glyceryl trinitrate showed that it has no equal in the drug treatment of angina pectoris.

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#### ANTHRAX. Lambert Rogers, M Sc., F R C S.

Anthrax is still an industrial hazard which confronts workers in wool and hides, and to a lesser extent also those who work on farms Reference to it was last made in the Medical Annual for 1948 (p 84) The Committee on

1.

Industrial Anthrax in the United States report (1943)¹ an alarming increase in the incidence in that country, particularly in the woollen industry. Until a wool disinfection station was established in England in 1921, wool anthrax in the States was almost negligible—3 2 per cent of total cases for the five-year period 1919–1923—but for the period 1929–1932 the percentage had risen to 27 2. This rise is attributed to the deflection of inferior wools to the States where disinfection charges need not be paid. The Committee advocate neoarsphenamine treatment for cases of anthrax

Herman Gold<sup>2</sup> of Chester, Pennsylvania, has published a review of 60 cases with a report on the therapeutic use of the *sulphonamides* These were all cases of cutaneous anthrax, 51 of which came from a local mill where goats' hair was being used for the manufacture of linings, while the remainder could be traced to possible contact infections with these Forty-one were males, 19 females, and their ages ranged from  $3\frac{1}{2}$  to 62 years The incubation period varied from 12 hours to 5 days The site of the lesions is shown in the table,

#### LOCATION OF ANTHRAX 'PUSTULE'

		Number of
Site		Cases
Face		14
Neck		11
Arm		5
Forearm		10
Hand		5
Finger		13
Leg		1
Heel		1
	Total	60

and the clinical features of some of them in *Plates V*, *VI* one of the sixty cases died. The importance of bacteriological confirmation of the suspected diagnosis is brought out and the value of anti-anthrax serum. From 200 to 500 c c should be given as an initial dose, to be repeated every 12 to 24 hours until cedema is checked. The author of this paper did not find neo-arsphenamine of much value when given in addition to serum, but had excellent results from sulphonamide compounds in 39 out of 42 cases for which he used them. He considers sulphathiazole the drug of choice, as although it proved slightly inferior to sulphapyridine in its effects it produced fewer unpleasant reactions. Large doses of sulphathiazole are advised as soon as the diagnosis is made. The drug is given for two or three days, and if by then the cedema is not controlled, anti-anthrax serum is administered in full doses. Gold concludes that sulphonamide compounds are a reliable and safe substitute for serum and believes that they should be given preference in treatment.

F. Krauss, also of Philadelphia, has reported a fatal case which primarily involved the nasal sinuses and produced intense cedema. The patient, a man aged 71, worked in a factory making leather art goods and the infection was apparently produced by spores carried in fine dust. The nasal secretion 24 hours after admission to hospital contained B anthracis and the organism was cultured from the blood. He died 4 days after admission. B anthracis was cultured from the spleen at autopsy. W. D. MacDonald, of Worcester, Massachusetts, also reports a fatal case in a man aged 38, who was a worker in a brush factory and developed a pustule on his forehead. Autopsy showed lesions in the small intestine. MacDonald points out that the prognosis of internal anthrax is grave in spite of the excellent results obtained in the subcutaneous variety.

REFERENCES — 1 Amer J publ Hith 1948, 33, 854, 2 Arch untern Med 1942, 70, 785, 3 Arch Otolaryngol 1948, 37, 238, 4 New Engl J Med 1942, 228, 949

#### PLATE V

# ANTHRAX (II Gold)



Fig. 1—The lesion is two days old and looks like a flea-bite pipule is croded and brown. A small amount of a dema is present. The timent was with sulphapyridine and sulphathazole.



Fig. B. The lesion shows characteristic central ulceration and a ring of vesicles Notice that the angle of the jaw is obliterated by a dema of the soft tissues overlying an enlarged lymph node. Treatment was with sulphapyridine

Plates 1, 11 reproduced from ' Irchives of Internal Medicine'

#### PLATE VI

#### ANTHRAX-continued

(H Gord)

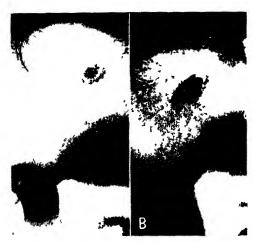
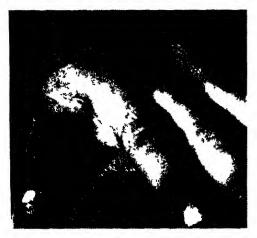


Fig C—A, The lesion shows a dry black eschar covering the central ulcer Edema of the soft tissues is present. Treatment was with sulphapyridine and serum B, The appearance of the lesion two days later. Notice the tenseness of the vesicles which form a ring around the central eschar Extension of the cedema has occurred with involvement of the infra-orbital space.



I ig  $\,D\,$ —Anthrax of the hand  $\,$  Note the small red papule and the surrounding a dema of the ulnar half of the hand  $\,$  Treatment was with sulphapyridine

### PLATE VII

### THE ARNOLD-CHIARI MALFORMATION

(I D INGRAHAM AND II W SCOTI)



The Arnold Chairi malformation is exposed during exploration of the posterior fossi

Reproduced from the New England Journal of Medicine?

- ANURIA, OLIGURIA, AND URÆMIA. Hamilton Bailey, FRCS S C Flo and H W Cummings performed decapsulation of a kidney on a woman aged 48, who, following an incompatible blood transfusion, had passed practically no urine for nine days At the time of the operation her condition was becoming despaired of, and she was passing into coma Very soon after the operation her condition improved, the vomiting ceased, and during the first 24 hours she excreted over 200 c c of urine The following 24 hours the urinary output rose to 625 c c Thereafter she recovered steadily
  T D Slagle and J A Pons<sup>2</sup> have found venesection followed by blood trans-
- fusion beneficial in advanced anuria
- H Foy et al 3 have examined the alkalinization hypothesis, and have come to the conclusion that there is insufficient evidence to warrant any statement as to its efficacy in either the prevention or relief of oliguria and anuma point out that anuria and oliguria are fairly common complications of blackwater fever, and their occurrence appears quite unaffected by the reaction of the urine
- S C. Shen et al 4 have proved that oliguna and microscopical hæmaturia are almost constant features after severe burns, whereas hæmoglobinuria is comparatively rare

Surgical Treatment of Bright's Disease.—C L Onnell and I D Munoz<sup>5</sup> are Chilean surgeons who have treated 25 cases of Bright's disease by renal decapsulation and denervation They realize that their report will be received with bias, but they are emphatic that good results accrue if the cases are chosen The best results are obtained in early cases of the acute phase of the disease. In chronic cases, those with pain and/or hæmaturia give encour-If, as so often is the case, medical treatment is abandoned only aging results when the patient is in the last stages of the disease, the surgical treatment of this condition will continue to have a bad reputation

REFERENCES — Surgery, 1943, 14, 216, J Urol 1943 50, 503, Trans R Soc trop Med Hyg 1943, 36, 197, New Engl J. Med 1943, 229, 701, J Urol 1943, 50, 34

#### APPENDIX, DISEASES OF. .1 Rendle Short, M D, F.R C S

Singularly little has been published during the year on appendicutes Craig,1 of Launceston, Tasmania, very pertinently calls the attention of practitioners to those cases in which there is no localization of pain, tenderness, or guarding in the right iliac fossa. These constitute, in his experience, some 3 per cent of all patients with acute appendicitis. The explanation is that the appendix lies in the pelvis. The pain is in the midline, and often, in young people, operation has to be performed on the strength of this pain, and nothing else Vomiting, rise of pulse-rate and temperature, and tenderness per rectum, may all of them be absent in the early stages, and if the appendix is to be removed before it perforates, they are not to be waited for pain in the midline of the abdomen, particularly when occurring in a young person, is due to appendicitis, unless it can be proved otherwise" [This is too sweeping, and would lead to much useless operating. Midline abdominal pain in schoolboys is often due to mesenteric lymphadenitis, for instance. Mid-abdominal pain coming on in children or young adults suddenly, with tenderness and guarding across the lower abdomen, and a slight rise of pulse and temperature, is probably due to appendicitis whether tenderness can be made out per rectum or not, and operation is called for -A R. S]

Wilfred Cark,\* writing in a South African journal, urges that on account of the great variety of types of acute appendicitis, and the variability of symptoms, which may prove to be very misleading as to the stage the disease has reached, immediate operation is always the correct treatment. The only exception he allows is when a deep walled-in abscess is present, which could only be reached by going across a 'clean' peritoneal cavity

Intussusception of the appendix is rare, only about a hundred examples have been reported. To these Kenneth Frasers adds 7 more from Glasgow The patient usually complains of very severe colic, with remissions. The condition usually persists for months. A correct diagnosis can sometimes be made with the aid of a barium enema. The intussusception may be complete, or partial. The appendix sometimes passes on into the ascending colon, or further. At operation it may be possible to pull it out and then remove it. When massive adhesions were present, excision of the execum, or hemicolectomy, has been found necessary.

References — Med J Aust 1948, 2, 485, S Afr J med Sci 1948, 8, 81, Brit J Surg 1944, 31, 23

#### ARNOLD-CHIARI MALFORMATION.

Sir John Fraser, M Ch, F R C S Ed
The Arnold-Chiari malformation is a congenital anomaly of the hind-brain characterized by a downward elongation of the cerebellum and brain-stem into the cervical portion of the vertebral canal

A convincing explanation of the error was advanced by Penfield and Coburn in 1938, they considered that the malformation was produced by traction on the brain-stem during embryonic life as a result of fixation of the cord to extracordal structures at a lower level, a situation which might arise in spina bifida of the myelomeningocele type In circumstances of normal development the growth of the vertebral column and the spinal cord proceed at an equal rate until the third month of intra-uterine life. After that date the column growth rate exceeds that of the cord, and, as the cerebrospinal junction level is fixed by the position of the cerebellum above the foramen magnum, the bony column may be said to grow away from the cord, with the result that the conus medullaris comes to occupy a level corresponding to the first lumbar vertebra It is apparent that, if the cord becomes fixed to the surrounding tissues as a result of such an error as spina bifida, at a time when disproportionate growth is proceeding, traction is likely to be exerted on the brain-stem, with the result that this structure and the inferior poles of the cerebellar hemispheres are drawn downwards through the foramen magnum. Such is the generally accepted explanation of the Arnold-Chiari malformation, and it is evident that the existence of a spina bifida in one or other form is an invariable accompaniment of the brain-stem error, though it is proper to add that there are those who question the constancy of the association, claiming that the Arnold-Chiari deformity may arise as a primary and independent development. and that it has no relationship to spinal-cord errors at a lower level

F D Ingraham and H W Scott¹ have made a valuable contribution to the study of the subject. Their observations are based upon 20 consecutive case examined at the Boston Children's Hospital, and it will be acknowledged that this careful and detailed investigation has provided valuable information on various aspects of the problem. They have confirmed the opinion of previous observers that there is a close association between myelomeningocele and the Arnold-Chiari malformation, and they appear to view the relationship as one of cause and effect, at the same time they exhibit the caution which is inseparable from science when they say "until this condition (invelomeningocele) is produced experimentally, it is not safe to conclude that the traction theory gives the complete explanation of the phenomenon." The effect of the brain-stem displacement is the development of internal hydrocephalus, the constancy of this error is confirmed by Ingraham and Scott,

who found the changes to be present in every case The mechanism whereby obstruction to the cerebrospinal fluid arises is self-evident, the compression of the medulla and the cerebellar 'tails' into the relatively narrow confines of the vertebral canal obliterates the foramina of Luschka and Magendie, thus closing the internal section of the circulation, while as a secondary influence interrupting the external cerebrospinal fluid circulation there is the compression of the subarachnoid space by the same traction effect

Treatment.—An appreciation of the mechanics of the brain-stem displacement and its effects raises the question of relieving the condition by surgical Ingraham and Scott have given close attention to this matter, and the procedure which they recommend is to excise the myelomeningocele, and thus in some measure relax the tension exerted at a higher level, a fortnight later a free brain-stem decompression is carried out. For this purpose a posterior midline incision is employed, and bone is removed over an area including the lower portion of the occipital bone, the posterior margin of the foramen magnum, and the laminæ of the upper cervical vertebræ (Plate VII) It is a heroic procedure, but it appears to offer the only means by which rehef can be obtained. So far it is not possible to offer a firm opinion on its benefits The authors bring out two points in relation to the Arnold-Chiari malformation which have not hitherto been recorded these are arrested development of the cerebral gyri, microgyria, and cranio-lacuna or patchy osteoporosis of the calvarium The explanation of the changes is not clear, but it is likely that circulatory disturbances play some part in them

To the pediatrician the main interest of the paper lies in its explanation of what has hitherto been regarded as a somewhat obscure development, hydrocephalus arising in relation to spina bifida. It is apparent that the sequence is related to well-defined mechanical influences, and, such being the case, there is a possibility that surgery may offer the means whereby relief can be given.

RIFLEFNCI 'New Engl. J Med 1943, 229, 108

#### ARRHYTHMIA. (See also Electrocardiography)

William Evans, MD, FRCP.

Arrhythmia in Surgery of the Chest.—J H. Currens, P D White, and E D. Churchilli reported arrhythmia in 12 patients from a series of 56 who underwent surgical treatment for carcinoma of the lung or cosophagus, 8 had auricular fibrillation, and 4 had auricular flutter. Age appeared to be a predisposing factor, for seldom did arrhythmia occur following thoracic surgery below the age of 40.

C C Bailey and R. II Betts<sup>2</sup> found arrhythmia, usually auricular fibrillation or flutter, in 8 out of 78 patients who underwent pneumonectomy but had no heart disease. They thought that vagal irritation which might follow infection or displacement of the mediastinum played a part in precapitating the abnormal rhythm. It was best to restore normal rhythm as soon as practicable either by rapid digitalization or by quinidine sulphate, since heart failure might set in if the rapid heart-rate continued for many days

Paroxysmal Tachycardia. The effect of intravenous injections of magnesium sulphate in 10 cases of paroxysmal tachycardia and one case of flutter was studied by L. J. Boyd and D. Scherf. The injection of a 10 per cent solution was beneficial in 3 out of 8 attacks, while 20 c.c. of a 20 per cent solution succeeded in 8 out of 8 attacks, and they therefore advocated the 20 per cent solution. Disturbances of conduction and ventricular extrasystoles appear for a short time after the injection. The rate of the paroxysmal tachycardia frequently diminished before the tachycardia disappeared. The results were

such that they recommended magnesium sulphate as a useful therapeutic procedure in paroxysmal tachycardia

#### Heart-block .--

Prolonged P-R Period —R B Logne and J F Hanson published their findings in 100 cases of prolonged P-R interval (0.22 second or greater). It was very difficult to be certain of the aetiology in many cases, but rheumatic fever was probably the cause in 28 and coronary atheroma in 12, although only 19 were reported without heart disease, there were 20 others that might be included in the same healthy group because they only presented neurocirculatory asthenia in 7, gonorrhea in 8, and rheumatic arthritis in 5. There was also a miscellaneous group of 11 cases. Of 38 cases in which the effect of atropine was tested, 25 showed a return to normal conduction. Although such a change might indicate a vagal origin to the block it did not indicate the absence of any disease in the conducting tissue.

Paroxysmal Heart-block—In A-V block the degree of impairment of conductivity is often found to be inconstant. Even when the rhythm appears normal, a cardiogram will usually show prolongation of the P-R period Exceptionally, conduction is normal between the attacks, when the designation 'paroxysmal heart-block' may be used J S Lawrence and G. W. Forbes<sup>5</sup> found reports on 18 such cases, 7 of which had periods of ventricular standstill, and 3 cases showed paroxysmal ventricular standstill without heart-block, they described a case of intermittent heart-block which occasionally showed ventricular standstill and at other times normal conduction. They suggested that arterial spasm or partial arterial occlusion played a part in the production of attacks which responded to inhalations of amyl nitrite

Complete Heart-block -M. Campbell<sup>6</sup> has described 64 cases of heart-block Complete heart-block is most often seen in men in the seventh decade with enlarged hearts and atherosclerosis but without other evidence of heart disease Syphilitic and rheumatic heart disease were between them only responsible for about 10 per cent of the cases In about 13 per cent it was found in congenital heart disease. Other myocardial disease was present in about 75 per cent, half of these consisted of cases with some degree of cardiac enlargement, but with no other disease apart from atherosclerosis of the aorta, among the other half there appeared hypertension, angina pectoris, Campbell classified complete heart-block as established, or or heart failure varying when it changed to other degrees of block. It might be transient due to a known infection or to an episode like cardiac infarction, or it might be paroxysmal, and this again showed two varieties, the one paroxysmal complete heart-block with latent heart-block as the customary rhythm, and the other paroxysmal heart-block, where the usual rhythm showed a normal P-R period Complete heart-block is a serious condition, especially in those with Stokes-Adams attacks Where it occurred in patients under 40 it might last for many years without proving a serious handicap

Stokes-Adams Attacks in a Child—Heart-block is known to occur in certain infections, but it is rare apart from diphtheria and acute rheumatism, and even in the latter it is uncommon. This complication in children is often fatal, but V S Stern has reported recovery in a boy aged 12 with pericarditis, in whom heart-block was punctuated by Stokes-Adams attacks. Stern concluded that the symptoms in his case had arisen either from rheumatic inflammation of the bundle tissue itself or its compression by inflammatory vascularization of the collagenous mass in the septum membranaceum

Incomplete Bundle-branch Block—In complete bundle-branch block the speed of conduction down one branch of the bundle is much slower than down the other, so that the impulse passes across the septum to activate the ventricle

on the affected side In *incomplete* bundle-branch block the difference between the two sides is less. The affected ventricle may receive the impulse partly from across the septum and partly through its own branch, or else, when the difference is slight, wholly through its own branch though with some delay. Alternately there may be delay in conduction down both branches C. W. C. Bains reported 6 cases of incomplete bundle-branch block. In none did the duration of the QRS exceed 0.1 second when this lesion was judged to be present. He was able to allocate his cases in three groups. The first showed a slight increase in the QRS without axis deviation as exemplified by the aberrant ventricular response to an auricular premature systole. This was probably due to a bilateral delay down each main branch. The second showed delay down one branch, fulfilling the criteria for bundle-branch block except that the QRS did not exceed 0.1 second. The third showed transitional complexes, probably due to a combination of delay down each main branch with additional delay down one branch.

REFERENCES — New Engl J Med 1943, 229, 360, \*Ibid 856, \*Amer J med Sci 1943, 206, 43, \*Ibid 1944, 207, 765, \*Brit Heart J 1944, 6, 58, \*Ibid 69, \*Ibid 66, \*Ibid 139.

ARTHRITIS. (See Chronic 'Rheumatic' Disorders)

## AXILLARY VENOSPASM: PRIMARY OR SPONTANEOUS THROMBOSIS. Lambert Rogers, M Sc, F R C S.

This condition was discussed in some detail in the Medical Annual for 1943 (p. 41), and previously in that for 1940 (p. 58) Many of the hypotheses put forward to account for it are fanciful and none can be regarded as entirely satisfactory The reviewer has always thought that the evidence for holding anatomical structures such as the costocoracoid ligament, the subclavius muscle, or the head of the humerus responsible has been weak Recently G E Iffrench has reported a case in detail and made reference to a second one. He suggests that in each of these cases exercise produced a sudden rupture of small tubutaries draining into the axillary vein and that the rupture led to thrombosis which spread into the axillary vein itself. Slight pyrexia which has been noted in these cases may be due to absorption of blood-clot from the ruptured venous tributaries Ffrench's patient was an airman, aged 22, who complained of a sudden diffuse swelling of his left arm which had begun 24 hours before, on rising from bed He was treated in bed with the arm raised on two pillows, and as after 48 hours the temperature had risen to 99 6" F., was given sulphathiazole. He was discharged to sick leave after 8 days. This suggestion of the tearing of venous radicles as the precipitating factor is reasonable. In many of these patients the onset follows some unusual movement such as using a screwdriver above the head The airman in question was employed on cookhouse duties and was in the habit of reaching for boxes and jars from high shelves

REFFRENCL - 1 Brit med. J. 1944, 2, 277

BEAN DISEASE. (See FAVISM)

BILE-DUCTS, SURGERY OF. (See GALL-BLADDER AND BILE-DUCTS )

BLADDER, SURGERY OF.

Anæsthetizing the Female Urethra Prior to Cystoscopy.—H. C Bumpus¹ rightly emphasizes that this procedure is too often left to a nurse who has not had adequate instruction and practice in the correct technique of rendering the urethra insensitive. Some 10 per cent cocaine solution should be applied

to the meatus on cofton-wool This is followed by a swab, well lubricated, as well as saturated with 10 per cent cocaine, inserted into the urethra itself for a short distance. In a few minutes a second swab should be inserted still farther. The whole procedure must take at least ten minutes. If, in addition, a few cubic centimetres of one of the cocaine derivatives is injected into the bladder, cystoscopy loses most of its discomforts. Bumpus emphasizes that procaine is useless for anæsthetizing the urethra in either sex. He has had no toxic effect from using cocaine in a large number of cases, provided the cocaine is freshly made, the danger lies in using a stock solution. The cocaine, therefore, should be freshly made up for each patient by dissolving two ½-gr tablets in 1 oz of sterile water. He uses this solution also for the male, and has proved its efficacy in thousands of cases. [Bumpus's technique for anæsthetizing the female urethra is remarkably effective, and can be recommended with confidence.—H B]

Rupture.—A boy of 17, while tobogganing, slid into a bush, and a branch of the bush, 18 in long and  $\frac{3}{4}$  in in diameter, passed through his anus and perforated the bladder. The stick was pulled out. On examination, upon inserting a finger into the rectum F R Guido² found that his finger passed into a perforation in the anterior rectal wall. Laparotomy was performed, but the peritoneal cavity had not been entered. The peritoneum was closed, and the bladder opened. The recto-vesical perforation was sutured and suprapuble drainage instituted. Recovery was uneventful

Cystis.—J E Fleischner<sup>3</sup> draws attention to the importance of not overlooking infection of the cervix when commencing to treat cystitis in the female Experiments have shown that when Indian ink is injected into the cervix of a guinea-pig, and the animal is killed four days later, particles of ink are found in the lymphatics which pass alongside the ureter to the kidneys. In cystitis secondary to cervicitis the main symptoms are leucorrhœa, backache, and frequency. Electro-coagulation of the cervix is the surest method of treating cervicitis.

Dissolving Vesical Calculi.—D J Abramson<sup>4</sup> has shown that pure phosphate stones in the bladder can be dissolved by continuous bladder irrigations through a urethral catheter with what is known as "solution G" of citric acid —

Citric acid (monohydrate) 32 3 g Magnesium oxide (anhydrous) 3 8 g Sodium carbonate (anhydrous) 4 4 g Distilled water ad 1000 c c

This method is worthy of attention when there are grave contra-indications to other surgical measures

C C Herger et al <sup>5</sup> report very favourably their experience with solution G in cases of persistently alkaline urine with a tendency to stone formation and incrustation. They favour continuous drip irrigation through a two-way Foley bag catheter over a period of from one to four weeks

Vesico-vaginal Fistula.—For closure, W Valmé<sup>6</sup> prefers the transvesical route, which affords better examination of the bladder and the ureteric orifices, which might otherwise be endangered by the repair. These are protected by the insertion of ureteral catheters

Suprapulic Cystostomy —Twenty-one years after suprapulic cystostomy had been performed for an impassable prostatic stricture by a surgeon who shortly afterwards died, Rendle Short' removed a prostate the size of a coconut The patient passed water naturally a month later. It is remarkable that the bladder should recover its function without hesitation after so many years.

Following suprapubic cystostomy, F C Hendrickson and H K Guth<sup>8</sup>

employ suction drainage In the later stages downward suction is used, and for this purpose Hendrickson's suction catheter (Fig. 8) is fixed in the urethra. For closure of a suprapubic bladder wound W. F. Melick<sup>6</sup> finds that, even when the bladder is infected, there is far less infection of the wound if catgut



Fig 8 -Hendrickson and Guth's suction catheter

is eschewed He uses catgut only, and very sparingly, for closing the bladder itself For the abdominal wall through-and-through nylon sutures are employed

Chifford Morson<sup>10</sup> is insistent that the tied-in catheter should be absolutely forbidden in the management of the paralysed bladder. Early suprapulic cystostomy will obviate the terrible bladder sepsis seen during the 1914–18 war

Patent Urachus.—In the matter of a month, D W Atcheson<sup>11</sup> was confronted with two cases of patent urachus The patients were 20 and 21 years of age respectively Urine had dribbled intermittently from the umbilicus of the first patient since early childhood, while the second had had an intermittent muco-purulent discharge as long as he could remember.

Neoplasms.—If J Jewett<sup>12</sup> finds that often a growth of the bladder is much more extensive than one is led to believe by cystoscopic examination, and

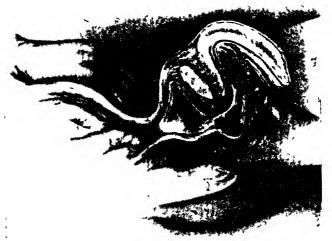


Fig. 9 Especially if conducted under spinal or general anæsthesia, bimanual palpation of the bladder is a useful method of determining the extent of a large vesseal neoplasm.  $(After\ Levett.)$ 

consequently in deciding whether total cystectomy is needed, other methods of examination are required. A very valuable one is bimanual palpation (Fig. 9) with the patient completely relaxed. This can be done most

conveniently after a cystoscopic examination, which has been conducted under spinal or general anæsthesia H J Jewett says that total cystectomy cannot be expected to cure cancer of the bladder unless the growth is confined to the bladder well

Neoplasms of the bladder occur in amiline dye workers 33 times more frequently than in other persons D K Rose<sup>13</sup> states that in an American aniline dye factory all the employees are examined cystoscopically once a year, and when they leave this form of employment they are recommended to continue the examination thereafter

References — J Amer med Ass 1943, 123, 615, <sup>2</sup>Calf and West Med. 1943, 58, 19, <sup>2</sup>Urol Cutan Rev 1943, 47, 553, <sup>4</sup>J Urol 1943, 50, 197, <sup>5</sup>Surg Gynec Obstet 1943, 77, 634, <sup>4</sup>J Urol 1943, 50, 40, <sup>7</sup>Brit med J 1943, 2, 484, <sup>4</sup>J Urol 1943, 50, 385, <sup>9</sup>Ibul 449, <sup>10</sup>Brit med J 1944, 1, 229, <sup>11</sup>J Urol 1944, 51, 424, <sup>12</sup>Brit J Urol 1943, 15, 121, <sup>12</sup>J Urol 1944, 51, 81

# BLOOD TRANSFUSION. (See also Anæmia—Concentrated Red-cell Suspensions in Treatment)

Sir Lionel Whitby, CVO., MC, MD, FRCP
Prompt and adequate transfusion of appropriate fluids is universally admitted to have contributed greatly to the reduction in mortality from battle injuries. The current year has brought many contributions by experienced Service officers on this important subject; these enable a better perspective to be obtained of the value not only of transfusion, but also of other measures used in the treatment of what is loosely called 'traumatic shock'. More information has accumulated about the risks of transfusion and the effect of blood donation on the donor, whilst the technique of transfusion by the sternal route has been greatly developed

#### TRANSFUSION OF BATTLE CASUALTIES

Theories of 'Traumatic Shock'.- J E Dunphy' defines 'traumatic shock' as a "state of actual or impending peripheral circulatory failure due to a reduction of the effective blood-volume, which is not primarily cardiac in Depending upon the mechanisms involved, so the reduction in effective blood-volume may be due to primary loss of fluid from the circulation (hæmatogenic) or to vasodilatation, caused either by nervous influences (neurogenic) or direct injury to the capillary walls (vasogenic), prolonged reduction of the effective blood-volume causes a sequence of pathological events irrespective of the original cause or causes (decompensated shock) Dunphy expresses the most widely accepted modern view-namely, that the fundamental treatment of 'traumatic shock' in military surgery resolves itself into the prompt replacement of blood with blood and of plasma with V H Moon's2 theory of increased generalized capillary permeability as a fundamental mechanism in causing 'shock' is not generally accepted D B Phemister, for example, and J Charnley, consider that local loss of both blood and plasma is the chief initiating factor, whilst J Fine<sup>5</sup> and E I Evans and his colleagues6 are not in agreement with Moon's theory other hand, though blood-volume reduction may be of first importance at the outset, H. N Green and colleagues7 have produced convincing evidence that a toxic factor, long suspected but never previously isolated, may develop in injured tissue sooner or later, and may greatly reduce the chance of recovery

Criteria for Assessment of Condition.—Widely different views are held as to the reliability of the various peripheral manifestations of circulatory embarrassment in an injured man, for the purpose of assessing the seriousness of his condition, for dictating treatment, and for choosing the optimum time for operation R H Formby<sup>8</sup> regards the initial blood-pressure as bearing a

quantitative relation to the amount of blood lost and as indicating the probable amount that will need to be transfused. On the other hand, J. McMichael® expresses the more widely held opinion that blood-pressure and pulse at the outset are unreliable criteria, but are valuable as serial observations for estimating the effect of treatment. V. Z. Cope¹® regards a subnormal temperature as a constant sign of serious shock, though R. D. Wright and J. Devine¹¹¹ state that skin temperature is quite unreliable. There can, however, be little doubt that the colour of the skin admirably reflects changes in the rate of peripheral blood-flow, and J. R. Di Palma¹², for example, considers that such changes are more diagnostic than those which occur in the blood-pressure and pulse-rate.

In a previous paragraph it has been made clear that the two fundamental factors causing the 'shocked' state are blood-loss and the development of toxic substances in the wound itself. The greater the blood-loss and tissue damage, the more serious is the condition likely to be. Assessment is therefore best made on broad lines, which include a guess as to the amount of blood-loss and a rough estimation of the tissue damaged. With massive blood-loss, massive transfusion is required; with massive tissue-damage, early operation is imperative, and may have to take precedence over a full response to transfusion. When transfusion and surgery can be associated, so much the better During the course of the transfusion, the peripheral manifestations which occur and chinical observations which are made will indicate the optimum moment, often fleeting, at which operation should be performed.

Treatment of 'Traumatic Shock'.-The finer points concerning transfusion, which is essential for all in whom hæmorrhage or plasma-loss has been large, involve questions of volume, rate, and choice of fluids But, as D S Dick12 points out, enthusiasin for transfusion sometimes overshadows the importance of general first-aid measures, such as arrest of hæmorrhage or immobilization of a fracture; other dangers are the excessive use of morphine and overheating; this last has also been stressed by A W Kay 14 J McMichael emphasizes how transient is the optimum period for operation, whilst H K. Lucas15 describes a practical method for transfusion during an ambulance iourney, designed to bring the wounded man to the surgeon, approaching, or having reached, a condition fit for immediate operation The observations of G. W. Duncan and his colleagues<sup>16</sup> support the long-held view as to the value of the 'foot-up' position. There is little satisfaction in restoring a man temporarily, only for him to deteriorate or die at operation or afterwards Supportive treatment after restoration of blood-volume is essential, whilst maintenance of condition during the post-operative phase is obviously required P Hoxworth<sup>17</sup> emphasizes the importance of proper water balance and adequate nutrition in assisting recovery or overcoming infection; vitamin deficiency may retard recovery in those dependent on parenteral feeding, and administration of thiamine (25 mg. daily), riboflavin (5 mg.), macin (25 mg), brewer's yeast, and vitamin K should be considered in selected cases

Choice of Fluids.—J. M Vaughan<sup>18</sup> discusses the use of blood, plasma, and serum in the treatment of injured and burned casualties, and points out the virtues of the dried products, which are always sterile, and which offer scope for different concentrations, according to need, she strongly advocates the use of twice or thrice concentrated plasma or serum for the treatment of burn cases which manifest hamoconcentration and ordema, especially of the face. On the other hand, for blood-volume reduction due to hamorrhage, H. Necheles et al.<sup>19</sup> and S. O. Levinson et al.<sup>20</sup> found that concentrated protein preparations were definitely inferior to iso-osmotic solutions. D S Dick, <sup>20</sup> from active-service experience, recommends the very high proportion of 4 parts of blood to

1 of plasma, as the ideal for those who have, suffered severe hæmorrhage, whilst H  $\,$ K Lucas  $^{15}$  found that large amounts of transfusion fluids were needed under tropical conditions by reason of dehydration. This last feature is of immense importance in wounded men, the virtues of a pint or two of glucosesaline are often forgotten

Volume and Rate—R H Formby<sup>8</sup> makes clear once again how large may be the volume that is required, any man exhibiting definite evidence of circulatory embarrassment requires at least one litre of protein fluid, most require two, and many three, in the early phases, the faster this is administered the better, the rate being appropriately slowed as recovery develops.

#### TRANSFUSION IN MEDICAL PRACTICE

As indicated in the Medical Annual for 1943 and 1944, there is a definite body of medical opinion which regards stored blood as lacking many of the ephemeral constituents of fresh blood. In medical practice these factors are often required. Stored blood finds its main use for the restoration of hæmoglobin, as with the simple anæmia of hæmorrhage, but, though convenient, it is by no means the therapeutic ideal for most medical diseases. J. S. Guest and K. C. Bradley<sup>21</sup> advocate the rotary pump method as the safest and simplest procedure, particularly for massive fresh blood transfusion. The use of red-cell concentrates in the treatment of simple anæmias is becoming increasingly popular, a good method for preparing these concentrates is described by M. L. Binder and A. Klein <sup>22</sup> (See also p. 26)

#### TRANSFUSION REACTIONS AND RISKS

Whether a fatal result follows a grossly incompatible transfusion depends upon many factors, including the volume transfused and the rate at which it is administered. In reporting a case with a favourable outcome, R. Drummond<sup>23</sup> describes a symptomless incompatible transfusion with a record of the resulting iso-agglutinin changes, in a Group B patient inadvertently transfused with 460 c c of Group A blood, the blood was transfused at a slow rate, which undoubtedly contributed to the happy outcome.

The question of intra-group compatibility, particularly that arising from immunization to the rhesus factor, has reached a bewildering stage of complexity. The necessary precautions are now essentially procedures for a skilled and experienced pathologist G D Ayer and W. F. Kammer²⁴ discuss these reactions and advocate the centrifuge cross-matching technique, as well as the biological test in all hospital patients who need repeated transfusions, F E Barton²⁵ forecasts the routine rhesus typing of all surgical and medical patients who are likely to receive repeated transfusions, of all obstetric cases before admission to hospital, and of all infants born with jaundice or anæmia

E Singer<sup>26</sup> describes the extremely rare phenomenon of immunization to the N factor As to pyrogenic reactions, they are said to be minimal with kaolintreated plasma prepared in the manner described by M Maizels,<sup>27</sup> whilst H. Naftulin et al <sup>28</sup> advocate the use of thick-walled viscose tubing in order to avoid the pyrexial reactions which are commonly attributed to rubber

W H Bradley et al <sup>29</sup> have found definite evidence of the transmission of infective hepatitis in 57 per cent of persons transfused from a particular batch of pooled serum, whilst K Maunsell<sup>30</sup> also describes jaundice and allergic reactions

#### BLOOD DONATION

Co Tui<sup>31</sup> and his colleagues recommend that those who give their blood for plasma preparation should have the red cells re-infused, they claim

that such donors are able to give blood frequently without ill effect. The Medical Research Council have prepared a report<sup>32</sup> concerning fainting in blood donors. It would appear that fainting is more common in women than men, and more in married women than those who are single, women appeared less likely to faint if bled during the fortnight preceding a period than in the two weeks following

#### BONE-MARROW INFUSION

The value and the ease of administration of transfusion fluids into bonemarrow cavities has recently been much emphasized. The favourite site is the sternum in the adult and the tibia in the newborn babe, infants, and young children. The bone-marrow may indeed occasionally be the only possible route, especially in extensively burned casualties, and sometimes in very shocked patients whose arm veins (through wounds) are not available, or whose leg veins are in such severe spasm that venepuncture or cannulation fails to admit blood, even with pressure In an infant, it is sometimes impossible to find a vessel sufficiently large to admit a needle or cannula, and a prolonged transfusion under such conditions is fraught with difficulties J. D. Gimson<sup>33</sup> reports having kept a needle in the tibia of an infant for as long as six days, having made the fixation firm with an adjustable strut and splinting of the limb known that an intravenous infusion of this duration would invite thrombosis and phlebitis, and probably call for several changes of vein Specially designed cannulæ or needles, with adjustable wings for attachment to the skin, or limb, have been described by Hamilton Bailey, 34 J D Gimson, 33 and Gerhard Behr 35 A pattern approved by The Medical Research Council is shown in the accompanying diagram (Fig 10) It consists of an ordinary Salah sternal puncture

needle, with screw to adjust the length of the needle, fitted with wings of soft malleable metal, which can be easily moulded round a limb, or attached flat to the skin above the sternum, it fits a Record syringe

Technique for Sternal Transfusion.—An area of skin just above the angle of Louis, in the midline, is anæsthetized by the injection of 1-2 c c of 1 per cent novocain solution. The area is gently massaged with a swab to disperse the anæsthetic, and the underlying periosteum is impregnated with the novocain. The needle, with stylet, is

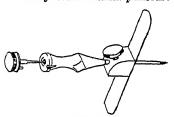


Fig 10—Medical Research Council pattern sternal transfusion needle, with adjustable stop

then inserted, being held at right angles to the manubrium, and a steady boring motion pressure is exerted until penetration of the outer bony plate of the sternum is felt—an unmistakable sensation. The angle of the needle is then altered, the point being directed upwards towards the patient's head, and entrance into the sternal cavity is proved by removing the stylet and attaching a previously prepared Record syringe containing 3 per cent sodium citrate solution. Some of this is slowly injected, the piston is then withdrawn, whereupon the red bone-marrow should admix with the citrate solution in the syringe, showing that the needle is correctly in situ. If no marrow blood mixture is withdrawn, the stylet must be reinserted and the needle adjusted till entry is proved. The syringe is then detached, the transfusion tube (in readiness and free of air bubbles) is linked up, and blood (or plasma) should flow freely into the marrow cavity at a rate of 60–100 drops per minute. The wings are strapped to the chest wall.

Technique of Tibial Infusion.—In the newborn babe or infant, J D Gimson advises the following technique The limb is first splinted in a semi-externally

rotated position One per cent novocain is injected into the skin, subcutaneous tissue, and over the flat subcutaneous plate of the tibia, inferior and medial to the anterior tibial tuberosity, i.e., below the epiphysis and above the nutrient artery. The needle and stylet are inserted at right angles to the bone, and the same boring motion used as for sternal puncture. The characteristic sensation of penetration into the marrow cavity is experienced and entrance proved in the usual way, with syringe attached. The needle is then linked up with the transfusion tubing. Gimson<sup>33</sup> has devised four needles of different sizes and lengths, which should meet all requirements.

Dangers and Difficulties of Bone-marrow Transfusion.—The posterior plate of the sternum can be pierced, especially if the operation be done hurriedly or great force used just at the critical moment when the needle is about to penetrate the anterior plate. This accident may cause a fatal mediastinitis. The danger of osteomyelitis or septicæmia is very real if strict asepsis is not maintained. Intense pain almost always follows the application of positive pressure with a view to increasing the rate of flow, positive pressure may also cause fat embolism

REFERENCES — Brit J Surg 1944, 32, 66, <sup>3</sup>Brit med J 1944, 1, 773, <sup>3</sup>Ann Surg 1944, 119, 26, <sup>4</sup>Brit med J 1944, 1, 716, <sup>6</sup>Ann Surg 1943, 118, 238, <sup>8</sup>Ibid 1944, 119, 64, <sup>7</sup>Lancet, 1943, 2, 147, <sup>8</sup>Med J Aust 1944, 1, 357, <sup>8</sup>J Amer med Ass, 1944, 124, 275, <sup>18</sup>Lancet, 1944, 1, 703, <sup>11</sup>Med J Aust 1944, 1, 21, <sup>11</sup>J Amer med Ass, 1944, 124, <sup>18</sup>Lancet, 1944, 2, 170, <sup>14</sup>Brit med J 1944, 1, 40, <sup>14</sup>Lancet, 1943, 2, 508, <sup>14</sup>Ann Surg 1944, 120, 24, <sup>17</sup>J Amer med Ass, 1944, 124, 483, <sup>18</sup>Ibid 1943, 123, 1020, <sup>18</sup>Surg Gynec Obstet 1943, 77, 387, <sup>18</sup>Did 475, <sup>18</sup>Med J Aust 1944, 1, 292, <sup>18</sup>Mer J med Sc, 1944, 208, <sup>18</sup>Brit med J 1944, 1, 488, <sup>14</sup>Arch whern Med 1944, 73, 199, <sup>18</sup>New Engl J Med 1944, 230, <sup>74</sup>Jancet, <sup>14</sup>Med J Aust 1943, 2, 29, <sup>18</sup>Lancet, 1944, 2, 205, <sup>18</sup>J Amer med Ass, 1944, 124, 331, <sup>18</sup>Brit med J 1944, 1, 279, <sup>18</sup>Ibid 748, <sup>18</sup>Ibid 181, <sup>18</sup>Lancet, 1944, 2, 472

### BLOOD-VESSELS, SURGERY OF. (See also AXILLARY VENOSPASM) Lambert Rogers, M Sc, F R.C S

Ligation of a Main Artery.—If it is necessary to ligature a main artery such as the femoral or subclavian, what steps should be taken to ensure a minimal disturbance of the peripheral circulation? These steps may be summarized

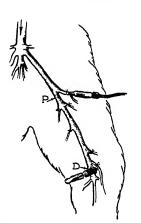


Fig 11—Experiment I Exposure of femoral artery in a dog Cannulization of the deep femoral branch for recording arterial pressure When the clamp was applied at D, the arterial pressure rose from 100 to 106 mm of mercury

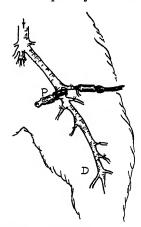


Fig 12—Experiment 1 When femoral artery was clamped at P, thus eliminating the blind segment PD, arterial pressure was increased from 100 to 112 mm, of mercury, thus doubling the increase in pressure produced by clamping the artery at D

as follows [Certain of the experimental and clinical evidence on which they are based was discussed in the last two numbers of the Medical Annual (1943, pp. 51, 52, 1944, p. 860)]

- (1943, pp 51, 52, 1944, p 360)]

  1 Injection of the sympathetic ganglia or appropriate sympathectomy at some time before ligation if possible
  - 2 Division of the artery between ligatures rather than ligature in continuity.

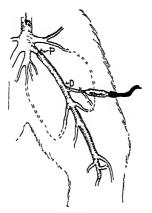


Fig 13—Experiment 8 Hac and femoral arteries isolated and cannula introduced into deep femoral branch for recording arterial pressure Application of a permanent ligature at P reduced the arterial pressure at D to 80 mm of mercury



Fig 14—Experiment 3 The application of a clamp on the femoral artery at D resulted in an increase in arterial pressure from 80 to 90 mm of mercury by eliminating the loss of pressure through purposeless distension of the blind segment DP

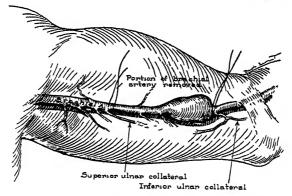


Fig 15—Brachial artery ligated just distal to superior collateral ulnar artery and just proximal to inferior collateral ulnar artery with excision of aneutysm and about 6 cm of normal artery (Figs 11-15 reproduced from 'Surgery, Gynecology and Obstetrics')

3 Where the site of the ligature is in a segment of artery from which no branch is arising, removal of this branchless segment so that the ligatures are placed just beyond and just proximal to branches which will form a large part of the collateral circulation Commander E Holman, USNR, has suggested that, whenever possible, it is advisable to ligature the main artery

just beyond a large branch so that the full force of arterial pressure is directed to expanding the branch and not to distending a blind pocket of the main artery. This pocket may be relatively large if the ligature lies at some distance beyond the branch (Figs 11-15) For a similar reason the distal ligature on the main artery should be applied just proximal to a large branch

- 4 Ligature of the accompanying vein This procedure was made an Army order in the last war and it has since been shown to be experimentally sound
- 5 A rapid blood transfusion of 800 to 1200 cc in order to open up the collateral circulation by increasing the volume of the circulating blood
- 6 Placing the limb at rest surrounded by ice-bags in order to reduce metabolism in it to a minimum over the period in which the collateral circulation is developing
- 7 Warmth to the rest of the body, eg, electric cradles, to produce a generalized peripheral vasodilatation and thereby enhance the peripheral circulation
  - 8 Elevation of the limb to heart level to remove the factor of gravity

Applying such principles, the reviewer has obtained a satisfactory result in the case of a seaman, aged 21, with a traumatic aneurysm which was caused by a bomb fragment and involved all three femoral arteries. The external line artery was ligated proximal to the sac, the superficial and profunda arteries were secured distally, and the sac resected.

The Place of Sympathectomy.—The value of sympathectomy at the time of, or after, the ligature is doubtful because it may result in an increased blood-supply to the skin at the expense of the muscles <sup>2</sup> Muscles can survive ischæmia for a shorter time than skin. H Barcroft<sup>3</sup> and his associates have shown that a cold white limb may have a deep circulation full of blood, and that muscle metabolites are the main factors causing vascular dilatation. It would appear reasonable, therefore, not to wash these metabolites away into the skin vessels by relaxing these by sympathectomy. If this reasoning is sound the place of sympathectomy would appear to be some time before

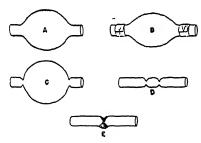


Fig 16—Diagrammatic representation of changes in aneurysm A, Pre-operative impression B, Immediately post-operative, cellophane applied C, Condition at time of first follow-up examination, May 1942 D, Marked shrinkage of aneurysm noted Oct 28, 1942 E, Last observation, Feb 8, 1948 (Reproduced from 'Annals of Surgery')

ligature of the main vessel so that the peripheral circulation is opened out, generally before the main effluent is shut down

Aneurysms Fibrosed by Cellophane. -In 1940 H E Pearse4 reported to the American Surgical Association that he had been able to occlude the aorta of dogs by inducing localized fibrosis through wrapping the vessel in cellophane The ability of cellophane to produce this type of tissue reaction was used by I N Page,5 in 1939, to induce perinephritis in experimental animals Cellophane has now been used to obliterate a subclavian aneurysm P Harrison and J Chandy,6 writing from Bahrain, Arabia, report two

cases in which the attempt was made. One of these was successful. The patient was an old pearl diver, aged 70, with an aneurysm of the third part of the left subclavian artery and intense pain in his shoulder. The Kahn test was negative. The aneurysm was exposed under local analgesia, and cellophane tape which had been boiled was applied as a five-layered collar, both proximally

and distally to it (Fig 16). The pain was not relieved for 10 months, but after 19 months the sac of the aneurysm was obliterated, the subclavian artery being interrupted by a deep groove filled with a fibrous mass. In the second case suppuration ensued and the artery had to be ligatured. The reporters of these cases think the method may be applicable to the aorta.

Aortic Embolectomy -Gordon Murray,7 of Toronto, has reported 5 successful aortic embolectomies The circulation was restored in all cases and impending gangrene of the legs averted The aortic bifurcation was approached extraperitoneally through a right paramedian incision. After temporarily clamping the iliac vessels below the clot and passing a tape round the aorta above it, the right common iliac artery was opened anteriorly and the embolus removed Heparin was introduced and the wound repaired After successful embolectomy the cold feet and legs change from a mottled, cyanotic, or marble white to a rosy pink colour and become warm. The patient should be heparinized for three days. In spite of the fact that most patients with the condition eventually die of further emboli, embolectomy may be satisfactorily performed even for aortic occlusion. Much relief is given to the patient if only for a brief period Murray's longest survival is three and a half years, the patient being alive and well at present, another succumbed after two years and nine months and a third after two years Both of the remaining patients died on the second day, the one from coronary occlusion, the other from cerebral embolism

Femoral Embolectomy.—L W C Massey and P Steiners report two femoral embolectomies and one performed on the right external that artery. In their first case the artery remained in spasm after removal of the embolus and gangrene ensued. In the remaining cases, therefore, they not only removed the embolus, but stripped the adventitia from the artery at the site of the incision in it and for an inch and a half above and below this. Spasm of the artery occurred but gradually passed off until the pulse wave became full. They consider this local periarterial sympathectomy combined with the embolectomy important.

F S. Wetherall<sup>9</sup> divides the treatment of arterial embolism into three phases. First papaverine should be given (½ to 2 gr) intramuscularly and the dose repeated in two hours' time. During this phase the patient is moved to hospital. Increasing warmth of the affected part with a return of the sense of touch and movements may indicate that a relief of spasm has occurred and a restoration of blood-supply, but if not Phase II is instituted. This consists of the administration of heparin and discoumarin and sympathetic block by novocain followed by alcohol injection. Phase III follows unless there is incontrovertible evidence of the return of the circulation, and consists of embolectomy. Continuous heparin infusion is given and the operation performed with local analgesia (adrenaline in the solution is avoided). The writer of this paper also advocates periarterial sympathectomy at the site of the embolectomy, but achieves this by injecting 1 per cent procaine beneath the adventitia above and below the site of the incision.

REFERENCES — Surg Gymec Obstet 1944, 44, 35, \*Lancet, 1944, 2, 443, \*Ibid 1, 489, \*Ann. Surg 1940, 112, 923, \*J Amer med Ass 1939, 113, 2040, \*Ann Surg 1943, 118, 478, \*Surg Gynec Obstet 1943, 77, 153, \*Lancet, 1944, 1, 245, \*N Y St J Med 1944, 44, 35

BONE-MARROW INFUSION. (See Blood Transfusion.)

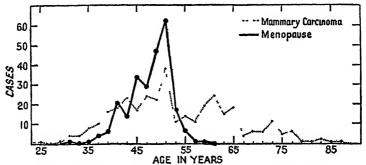
#### BREAST, SURGERY OF

Lambert Rogers, M Sc, F R C.S.

Carcinoma.

Mammary Cancer and the Menopause —The close association of carcinoma mammae with the menopause is drawn attention to by E. K Dawson¹ of

Edinburgh in a paper with this title and illustrated by the accompanying graph (Fig. 17) After discussing the possible influence of hormonal changes and the histological features of the involuting breast, he reaches a conclusion which surgeons should note "It is difficult for the pathologist", he writes, "not to be biased in favour of simple amputation in these doubtful mammary cases of middle age "He cites the case of a woman, aged 47, whose right breast was removed by simple amputation because of what was regarded as a generalized cystic condition. Routine small sections made at the time confirmed the clinical diagnosis. A slice of the whole breast was embedded in preparation for section later, but not actually cut for over 3 years and not examined for 7 years. When at this time the large section was studied, near the largest of the cysts a small but definite carcinoma with early infiltration of the adjacent fat was revealed. The patient is alive and well 22 years after the simple amputation, neither the surgeon nor the patient knows that the



The age-incidence of mammary carcinoma and the menopause.

Fig 17—Showing association of carcinoma of the breast with the menopause (By kind permission of the 'Edinburgh Medical Journal')

condition was malignant. [Few surgeons will dispute the soundness of the advice not to perform biopsy on the breast at the menopause, but rather simple amputation —L C  $\bf R$  ]

Mammary Carcinoma in Youth -T de Cholnoky2, of New York, disputes the general impression that the prognosis in carcinoma of the breast in young women is unfavourable as compared with that in older patients He quotes Ewing's depressing statement, "Before 30 years of age mammary cancer is extremely fatal so that some surgeons prefer not to operate during this period", and then surveys the results of surgical treatment at the New York Post-Graduate and other hospitals Seventy-three cases of mammary cancer in patients under 30 were collected. Of the 73 cases, 14 were inoperable when admitted to hospital Twenty were alive, constituting a 40 per cent five-year arrest Six of 16 patients operated upon 10 years previously were alive He finds that cancer of the breast in patients under 30 years of age accounts for 2 per cent of all mammary cancers, and concludes that the results of radical surgery for carcinoma of the breast in young women under 30 years of age are comparable with those obtained in older women

The Operation of Radical Amputation—It is fifty years since W S Halsted (1894) published his now classical paper on his first 50 cases operated upon by his method, the basis of the modern operation—Unfortunately, not all surgeons practise Halsted's principles, and, even with the advances in technical methods

#### PLATE VIII

### SKIN REMOVAL IN BREAST CANCER

(J S RODMAN)

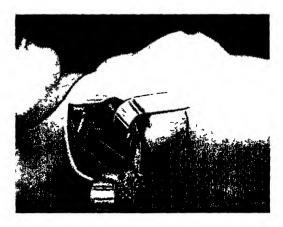


Fig. A—Axilla dissected first—Straight incision on chest wall beginning 1 in below clavicle 2 finger breadths from edge of shoulder, extending downward 4 or 5 in through skin and subcutaneous fat—Pectoral portion of pectoralis minor divided at their insertions—Axillary node tearing fat and fascia dissected from above downward—Vessels ligated at source of origin—Subscapular nerve on posterior wall and long thoracic (external respiratory nerve) on inner wall preserved

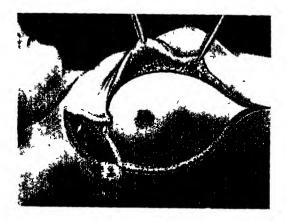


Fig. B—Egg shaped incision around breast and well down on to upper rectus Large amount of skin removed. Extensive undermining of skin begun. At no point should edge of skin remaining have been closer than 2 in to edge of growth

### PLATE IX

# SKIN REMOVAL IN BREAST CANCER—continued (J S RODMAN)

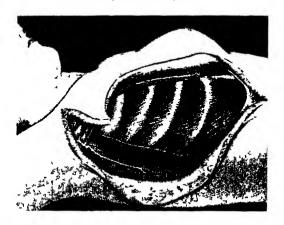


Fig C—Entire breast with overlying skin and underlying pectoral muscles with axillary nodes and upper pectoral fiscal on affected side removed. Undernining of skin carried over to midsternal line in front and to edge of trapeous behind

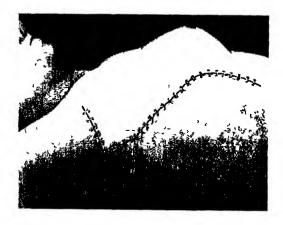


Fig. D.—Wound closed—drun to axillu—extensive undermining makes grafting unnecessary

Plates VIII, IX reproduced from the ' 1nnals of Surgery'

which have come about since his day, fail to achieve his degree of success. The Halsted operation has been modified in many ways and few spend the three hours in its careful performance which the originator was accustomed to do Writing on criteria for successful avoidance of local recurrence, J S. Rodman, of Philadelphia, discusses the question of the amount of skin and fascia which should be removed. He emphasizes the importance of wide skin removal, and believes that by combining wide skin and fascial removal local recurrences can all but be eliminated. Furthermore, he holds that if the Rodman amputation is performed, these criteria can be achieved without the necessity of skin grafting or subsequent impairment of the usefulness of the arm. He reports 3 instances only of local recurrence in 132 cases (against over 20 per cent reported in some other well-known tumour clinics). The steps in the Rodman technique are illustrated in Plates VIII, IX

[Claims are made for this technique that the surgeon works from a clean into an involved area, the breast is handled less than when the surgical attack begins with the breast itself, the blood-supply is better controlled so that blood loss is less, and by avoiding extending the incision across the anterior axillary wall into the arm itself, there is less likelihood of interference with arm movements later (and possibly also of the occurrence of lymphædema—see Medical Annual, 1944, p. 54)—L. C. R.]

Brodie's Tumour.—Reference was last made to this tumour in the Medical Annual for 1943 (p. 59), in which a particularly large example removed by Professor Rendle Short, of Bristol, was illustrated (Plate IX). These tumours, which are variously known as soft fibro-adenomas or serocystic disease, are usually benign, but may behave as sarcomas W G Cooper and L V. Ackerman, of Missouri, report 3 cases, using the term cystosarcoma phylloides to describe them. Their cases occurred in women aged 57, 75, and 51 respectively, and the tumours were characterized by slow growth over several years, then more rapid enlargement. One of the tumours recurred twice, invaded muscle and lymph-nodes, and showed numerous mitotic figures on histological examination. The authors comment on the benign behaviour of most of these tumours, and in common with other surgeons advocate merely wide local excision. Certain of the tumours, however, behave as fibrosarcomas do elsewhere in the body, tending to invade and recur locally. For these, radical amputation with dissection of the axilla is indicated.

REFERENCES — \*Edinb med J 1943, 50, 721, \*Surg Gynec Obstet 1943, 77, 55, \*Neoplastic Disease, Saunders, Philadelphia, 1940, \*Ann Surg 1943, 118, 694, \*Surg Gynec Obstet 1943, 77, 279

BRONCHIECTASIS. (See also RADIOLOGY) Maurice Davidson, M.D., F.R.C.P. Myocarditis in Bronchiectasis.—References to the condition of the heart in bronchiectasis are not numerous, and in view of the comparatively scanty attention paid to this point the findings of O Saphir<sup>1</sup> are of interest total of 6257 cases which came to autopsy, 152 (2 44 per cent) were found to have bronchiectasis In 8 of these (526 per cent) evidence was found of associated myocarditis Of these 8 patients 1 was a child of 5 weeks, the ages of the other 7 ranged from 33 to 77 years The child had congenital bronchiectasis and collapse occurred after performance of a thoracentesis The adults had suffered from chronic respiratory disease and died after varying periods in hospital. In only 1 out of the 8 cases was a diagnosis of myocarditis made during life Brief but informative details are given of the clinical data referable to the cardiovascular system, with a reproduction of an electrocardiogram taken in one of the cases. The notes of the post-mortem findings are specially interesting, including as they do the microscopical appearances of sections of the heart muscle In 3 of the cases the myocarditis appeared to be recent, in 2 it was a true chromic myocarditis, and in 1 subacute. In one instance recent myocarditis was found associated with myocardial fibrosis (the patient being a diabetic with an enlarged heart and coronary arteriosclerosis); in another it was associated with an old anterior infarction and an aneurysm of the heart. The author emphasizes the fact that a clinical diagnosis of myocarditis was made in 1 case only, the data on which it was based being enlargement of the heart and a high pulse-rate (186), which later became irregular, though the temperature was only slightly raised (99° F). He goes on to point out that in retrospect such a discrepancy between the pulse-rate and the temperature was definitely noted in 3 patients, while in 2 others there was a similar slight disproportion which he thinks may be of significance

In discussing the histological findings in these cases, taken in conjunction with the known infection of the respiratory tract, the author concludes that the cause of the myocarditis in some of them at any rate in which there were no other infections is likely to have been the bronchiectasis. Although organisms were found in the myocardium in only one instance, he suggests, nevertheless, that the suppuration, the large number of bacteria present in the dilated bronchi, and the acute and chronic inflammation of the bronchial walls could easily constitute a primary focus of infection to which a myocarditis could be ascribed In no single instance was an endocarditis discovered. In the concluding part of the paper Saphir attempts to find corroborative evidence for the above hypothesis in a study of the literature relating to myocardial complications in various related respiratory diseases In most of the available reports on the post-mortem findings in patients dying of bronchial asthma with bronchitis he found that little attention had been paid to the possibility of microscopical changes in the myocardium, death being attributed to asphyxia, but he quotes 1 case reported by F H Chafee, J R Ross, and E. M Gunn<sup>2</sup> of myocarditis in a patient who died suddenly after an asthmatic attack Examination of the heart post mortem showed massive infiltrations throughout the myocardium of eosinophil polymorphonuclear leucocytes, a few lymphocytes, and plasma In addition, there were small foci of necrosis. In 2 other cases of fatal asthma these authors described an inflammatory infiltration of the myocardium by cells

Further evidence was sought by Saphir in the post-mortem records of the Michael Reese Hospital, from which he quotes 3 fatal cases of bronchial asthma in which routine histological examinations of the myocardium had showed no inflammatory lesions. In view, however, of the observations referred to in the cases of bronchiectasis, fresh blocks were cut of the myocardium from the 8 asthma cases, and careful re-examination of these sections showed evidence of myocarditis in one of the three Emphasis is laid on the need for the most careful microscopical examination and the cutting of many sections before the presence of myocardial lesions in such cases can be definitely excluded

Medical Treatment of Bronchiectasis.—The treatment of infected bronchiectasis by various palliative measures in cases which do not admit of radical surgery is often disappointing by reason of its limitations. Considerations such as these have led C M Norris's to investigate the possibilities of treatment by drugs of the sulphonamide group. Preliminary observations were made to study the distribution of the sulphonamides among the body fluids, i.e., to determine (a) the correlation between blood-levels of sulphonamide following oral administration and their concentration in the bronchial secretion after intra-tracheal or intrabronchial infiltration of the drug, observations being made at 24-hour intervals following the instillation. It was found that the concentration of sulphadiazine in the bronchial secretion during oral administration was

approximately 60 per cent of the blood content, and this proportion was not materially affected by the extent of the disease or by the amount of expectora-After intratracheal or intrabronchial instillations of 5 per cent microcrystalline sulphathiazole in aqueous suspension larger concentrations of the drug were shown in cases in which there was but little expectoration Experiments in regard to treatment suggested that the general effect of sulphonamide compounds was favourable, especially when combined with periodic bronchoscopic aspiration Oral administration was preferred to the method of instillation, partly from consideration of the patient's comfort, partly because it enabled a more diffuse, uniform, and prolonged action than was attained by instillation The combination of sulphonamide therapy with bronchoscopic aspiration in 10 cases of bronchectasis was successful in causing a considerable reduction in the daily amount of sputum and in producing favourable alterations in the bacterial flora The author's observations are presented only as a preliminary report, but the tentative results suggest that the treatment employed may prove after more extended trial to be of definite value, not only in cases of long standing which for various reasons are not regarded as suitable for radical surgical measures, but also as a pre-operative measure in cases in which lobectomy or pneumonectomy is contemplated

Carbon Droxide by Inhalation as an Expectorant —The observations of A L Banyai and A. V Cadden4 on the inhalation of CO, may have a definite bearing upon the class of case just discussed. After a short review of various experiments on the effects of such inhalation upon the body, these authors give an account of their clinical experience since 1930, when they began to use it in the treatment of cases of tuberculosis. They point out that the failure of expectorants is not infrequently due among other causes to the viscid and tenacious character of the inflammatory exudate which has accumulated in the bronchial tubes, and also to lack of free bronchial drainage owing to obstruction of the bronchial lumen by a plug of mucopurulent secretion The mixture used by them consisted of 10 per cent carbon dioxide and 90 per cent oxygen, and was administered in most cases by a BLB mask. Inhalations were administered once, twice, or thrice daily, the length of each treatment varying from 5 to 15 minutes, the flow-meter being set for 4 to 5 litres per minute for closed inhalations (5 to 7 litres if an open method were used) By such means they found they were able to change an excessive though unproductive cough into a useful cough, and to lessen the dangers incidental to the accumulation, retention, and inadequate expectoration of inflammatory excretions (e.g., pulmonary collapse, absorption of inflammatory products leading to toxæmia, spread of disease, and production of blocked cavities through check-valve action of plugs of sputum) The principle of CO<sub>2</sub> inhalation is, of course, well recognized, but this paper is a valuable reminder of its importance and a practical guide in the treatment of inflammatory conditions affecting the bronchi in cases where adequate drainage has not been attained by other means

REFERENCES — 'Arch intern Med 1943, 72, 775, 'Ann intern Med 1942, 17, 45, 'J. Amer med Ass. 1943, 123, 667, 'Amer J med Sci 1943, 206, 479

#### BRONCHIECTASIS: SURGICAL TREATMENT.

A Tudor Edwards, M.Ch, FRCS

Lobectomy or pneumonectomy has been the accepted treatment for cases of established bronchiectasis over a period of fully ten years, but in the last four or five years there has been a definite change in the technique. Whereas in the earlier years, apart from one exception, operation was carried out by the use of the tourniquet, there has been an increasing tendency in recent years to employ the procedure of individual ligation of the vessels to the lobe and

finally to divide and suture the bronchus The obvious advantage of this procedure over the tourniquet method is that the lobe is completely removed, whereas in the other method a large stump is left with its septic secondary bronchial stumps and its certainty of developing an empyema and generally bronchial fistula which take time to close and heal Further, when certain segments of a lobe are involved, it has been shown to be possible to dissect such segments without necessarily removing the lobes which contain them—this applies to the lingular process of the left lung, the dorsal segment of either lower lobe, and the pectoral lobe portion of the upper lobe

Many anatomical studies have been made of the lung, with particular reference to the relation of segments of the lung to the bronchi and the vascular relations of such segments. The normal distribution and its variations have been observed by A B Appleton¹ and well repay study by those interested R. C Brock² has also observed the anatomy of the bronchial tree with special reference to the surgery of pulmonary abscess

The results of such investigations is that we are only now getting a full realization of the anatomy of the lungs, and the removal of segments or lobes by dissection technique is being placed on a sound basis

T Holmes Sellors and Vernon C. Thompson<sup>s</sup> record their experiences with 100 consecutive cases of lobectomy by the dissection technique. The outstanding advantages on theoretical grounds of the dissection method over the tourniquet method they state are (1) The possibility of secondary hæmorrhage is diminished, (2) The chance of fistula formation is diminished by careful closure of the bronchus, (3) Sepsis in the hilar stump is eliminated, (4) The removal of the lobe can be said to be total rather than sub-total

The operation is preceded by the induction of pleural adhesions over the upper lobe In spite of different methods employed for closure of the bronchus, bronchial fistula developed in 42 per cent of cases Primary drainage was employed in 60 per cent of cases Four deaths occurred within one month of operation and four died subsequently, three of them from tuberculosis and one from cerebral abscess The resections comprised lower lobe on either side in 45 cases, with good result in 88, right middle lobe in 8 cases, all with good result, right middle and lower lobe in 10 cases, with good result in 9, left lower and lingula in 35 cases, with good result in 27; right or left lower lobe with pectoral in 1, with good result, right middle and pectoral in 3, all with good result, left dorsal segment in 1 case with good result, and resection of left pectoral and lingula in 1 case with good result A good result means full expansion of remaining lung tissue with no sputum or only a trace. The total results thus show a good result in 83 per cent These authors go fully into the question of expansion of the residual lobe and emphasize its importance in rapid and permanent cure Massive collapse as a complication is reduced by the pulmonary formation of adhesions on the residual lobe, and when collapse occurs in the adherent lobe expansion is much more rapid

In the opinion of these authors, which is in complete agreement with that of the reviewer, the main advantage of dissection lobectomy lies in the eliminatof the septic bronchial stump and therefore the reduction in post-operative pulmonary and pleural sepsis, and in the speeding up of convalescence.

REFERENCES — Lancet, 1944, 2, 592, \*Guy's Hosp Rep 1943, 92, 82, \*Lancet, 1944, 2, 101

# 'BULLIS FEVER': A NEW RICKETTSIAL DISEASE.

Sir Philip Manson-Bahr, CMG, DSO, MD, FRCP.

J C Woodland, M M McDowell, and J T. Richards' report that in the summer of 1942 33 cases of a new disease entity heretofore undescribed occurred in soldiers at Camp Bullis, near Houston, Texas All had been

bitten many times by a common tick—Amblyomma americanum—shortly before the onset of the fever. The fever lasted 3-7 days in 27 cases, 8 days in 2, 11 and 13 days respectively in the remaining 2. Onset was abrupt, most had post-orbital or occipital headache, fall was by lysis, and convalescence protracted especially in severe cases. General adenopathy was common in 10 per cent a maculo-papular rash was seen on the trunk early in the course of the fever, in some it was like that of endemic typhus, in others like that of German measles. Pronounced leucopenia occurred on the second or third day, falling to 3000 and associated neutropenia. Evidence was highly suggestive of a tick-borne infection. This fever has resemblances to Colorado tick fever.

H R Livesay and M Pollard² report that 50 ticks (Amblyomma americanum) collected in affected areas were tested by guinea-pig inoculation. One positive result was obtained in which intracerebral inoculation caused a rise of temperature to  $106^{\circ}$  F. It was concluded that 'Bullis fever' is a previously undescribed syndrome caused by rickettsiæ

L Anigstein and M N Bader<sup>3</sup> initiated a study in July, 1943, on 500 adult Amblyomma americanum from Camp Bullis, Texas, which were divided into five batches of 100 each, and emulsions of each group of ticks inoculated into guinea-pigs and mice. Out of one group of 100 ticks a strain of infectious agency was established in guinea-pigs and carried in passages. Guinea-pigs reacted with fevers of various types, with splenomegaly. In mice the infection is manifested by splenomegaly only. Generally speaking, the symptoms and pathological lesions correspond to those in guinea-pigs and mice by human 'Bullis fever'. An intracytoplasmic rickettsia invading lymphocytes and monocytes similar to that observed in strains of human origin was established in various tissues of guinea-pigs and mice injected with the strain of tick origin.

It seems, therefore, highly probable that the rickettsia recovered from Amblyomma americanum of Camp Bullis, Texas, represents the agent of 'Bullis fever' 'Bullis fever' would therefore appear to be a rickettsiasis conveyed in nature to man by A americanum—in addition to the already well-known spotted and Q fevers

REFERENCES — 1 Amer med Ass 1943, 122, 1156, 2 Amer J Trop Med 1943, 23, 475 3 Texas Rep Biol Med 1943, 1, 298

# BURNS AND DISTURBANCE OF LIVER FUNCTION IN CHILDREN. Sur John Fraser, M Ch, F R C S Ed

One of the causes of death in consequence of burns is an acute toxemia It is more common and more severe in infants and young children than in adults, and its intensity appears to be directly proportionate to the extent of the injury In 1938 W S Wilson and his collaborators showed that the toxemia was accompanied by severe and widespread liver damage in the form of a centrilobular necrosis, and they considered that the liver lesion was attributable to the effect of a non-bacterial toxin circulating in the blood during the days immediately succeeding the injury Various explanations were advanced respecting the source of the toxin, ultimately it was suspected that tannic acid, employed as a coagulant of the burn, was one of the agents Evidence in support of this view has been supplied in a recent paper by S L Rae and A W Wilkinson 1 Employing the lævulose tolerance test as a means of estimating liver function, they carried out the tests on a series of burns treated respectively by (1) coagulation with 2 per cent gentian violet followed by 10 per cent silver nitrate; (2) coagulation with a proprietary jelly containing 5 per cent tannic acid and one part in 5000 of merthiolate in a watery

base, (3) dressings of a paste containing varying amounts of sulphacetamide in a eucerin base. The findings were (a) that impairment of liver function occurs most often after the use of a jelly containing tannic acid and merthio-late—they do not suggest that the tannic acid is the sole toxic factor, they consider that the deleterious effect may be attributed in part to the merthio-late, (b) that sulphonamide drugs are rapidly absorbed from the surface of superficial burns, and, being so, a toxic blood concentration results which may lead to liver damage, and (c) that when silver nitrate is employed as a coagulant, liver damage is relatively slight. The ultimate conclusion is that coagulation treatment of burns has so many advantages that it should be continued, but, in view of the minimal toxic effects of silver nitrate, this substance should be employed as a coagulant in preference to tannic acid

Reference -1 Lancet. 1944. 1, 332

#### BURNS OF WAR.

Cecil P G Wakeley, CB, DSc, FRCS

During the year 1944 a mass of experimental work has been undertaken both in this country and America dealing with the healing of burns. Perhaps the most outstanding practical issue from all these data is the importance of pressure bandages applied over dressings to prevent the escape of plasma from the burnt area and from the tissues in the immediate neighbourhood.

In Service burn casualties, especially if many have to be treated at any one time, there can be no doubt that local treatment should be reduced to a minimum until the initial shock has been reheved. Too many burn cases die because an anæsthetic is given while cleansing and debridement are carried out. Anæsthesia is not necessary. Intravenous plasma is given to reduce the hæmoconcentration, and 2 g of sodium sulphadiazine can be introduced into the plasma to give an initial high blood-level. The burnt area is covered with sterile gauze impregnated with boric acid. This is covered in turn with a layer of sterile gauze, the whole dressing being kept in place by means of an elastic roller bandage.

Surgeons rightly claim that by omitting any form of cleansing less harm is done to the epithelium in the neighbourhood of the burnt area

Triple Dye Soap Mixture.—This mixture consists of triple dye (gentian violet 1 per cent, brilliant green 1 per cent, and acriflavine 1 per cent), to which is added a solution of potassium oleate. When this mixture is sprayed on to a burnt area a durable, non-contractile painless coagulum is formed. C. N. Robinson has treated over one hundred burnt cases by this method without a death. The burns included the face, hands, and limbs. As a first-aid measure this method has definite uses, no dressings are required and toxemia is reduced to a minimum.

Burns Treated with Viacutan.—A 1 per cent solution of viacutan (silver dinaphthylmethane disulphonate) is advocated in the treatment of burns of the face and hands by F Pick and D Barton <sup>2</sup> Viacutan is painless when applied and produces a flexible coagulum which does not crack. It was found that viacutan in a dilution of 1–16,000 inhibited the growth of the common pyogenic organisms (including Proteus) in broth culture and in broth-serum media. Perhaps the most useful fact about this treatment is its ease of application, quick healing, and that little supervision is required; also there is no staining of the skin or bed linen.

Human Fibrin as a Dressing for Burns.—Although fibrin film has been used in war surgery it has only been employed in the treatment of a very few burns. It has been quite definitely proved that the continual oozing of fluid from a superficial burn is due to capillary injury and not to defective coagulation Therefore human fibrin would appear to be very useful in preventing the

exudation from burns R G Macfarlane³ has used membranes made of human fibrin in the treatment of a small number of burns, but is not convinced of its practical usefulness. It would be more economical to transfuse the patient with the plasma required to make the membrane

Burns of the Eyelids and Conjunctiva.—A large proportion of burns sustained in the fighting services involve the eyelids. Although protective goggles and anti-flash gear are supplied to the Royal Navy and the Royal Air Force, these are not made use of as much as they might be. In a discussion at the Royal Society of Medicine, C. P. G. Wakeley, D. C. Bodenham, T. P. Kilner, et al. 4 were all of the opinion that coagulants should never be used for burns of the face and eyelids. The cleansing should be performed with a synthetic detergent C. T. A. B. ("Cetavlon"), and this be followed by a dusting of sulphonamide powder or the application of a 3 per cent cream. Over this some tulle gras should be applied. For all deep burns skin-grafting should be undertaken as soon as possible so as to eliminate any hid retraction.

Value of Penicillm in the Treatment of Burns.—Most surgeons will agree that on clinical grounds penicillin is more active than the sulphonamides in removing streptococci and staphylococci from infected burned surfaces. Penicillin is also useful in treating those infected burns which are resistant to the sulphonamides D C Bodenham<sup>5</sup> has used a powder mixture and a penicillin cream with good results. The powder is made with sulphanilamide and light magnesium oxide to which is added calcium penicillin to give a strength of 1000 units per gramme. This powder is 'frosted' on the burnt surface and can be used on granulating areas prior to skin grafting. The cream is made up with soft paraffin and lanette wax to which is added a penicillin solution so as to give a strength of 1000 units per gramme. The cream is applied every twenty-four hours and healing is sound in the majority of cases.

Sulphanilamide Ointment Treatment.—With the extended use of various sulphanilamide ointments in the treatment of burns more clinical results become available E I Evans and M J Hoover<sup>6</sup> describe an ointment which has given good results in their hands. It is made by adding sterile sulphanilamide powder to a mixture of equal parts of sterile landin and cold cream, so that the final concentration of sulphanilamide is 6 per cent by weight. The ointment is applied after initial cleansing and is covered with sterile gauze, the whole dressing being held in place with a firm pressure bandage. The dressings are changed every third day, and healing is quick and sound.

The Value of Vitamins in the Treatment of Burns.—With the continued investigation of war burns it is quite evident that badly burnt patients are very deficient in vitamin C—in fact, in some cases there is no vitamin C in the blood. It may well be that in such cases the vitamin capsules may not be soluble in the intestinal juices, or the vitamin C may not be absorbed from the intestines. If therapy per mouth is not satisfactory vitamin C should be given intramuscularly. Generally 1 g. of vitamin C by mouth should be given daily to all severely burned patients. Under such treatment healing is improved and there is an improvement in the appetite and well-being of the patient.

Resistant Burn Cases.—With the advent of the sulphonamide group of drugs and penicillin it was thought that all the troubles connected with the treatment of burns were over. This, however, is far from the truth, as burns infected with *Proteus*, pyocyaneus, and B coli are all resistant to both these forms of treatment. Such organisms prevent early skin-grafting and are the cause of contracture and keloid formation. There are few antiseptic applications which will cause the destruction of the difficult trio, but Milton and urea formic iodide (U.F.I.) are by far the most effective, and cause rapid elimination of all these organisms

Extensive burns in the anal region are very liable to become infected with  $B \ coln$ , and U F I powder will keep the burnt area clean and allow skin-grafting to be performed right up to the anal margin (Plate X)

REFERENCES — Lancet, 1943, 2, 351, 'Ibid 408, 'Brit med J 1943, 2, 541, 'Proc R Soc Med (Ophthal Sect ), 1943, 37, 29, 'Lancet, 1943, 2, 725, 'Surg Gynec Obstet 1943, 77, 867

CARDIAC. (See also HEART)

### CARDIAC INFARCTION. (See also ELECTROCARDIOGRAPHY)

William Evans, MD, FRCP

Cardiac Infarction in Young Subjects.—A J French and W Dock¹ have recorded their clinical and pathological analysis of 80 fatal cases of coronary disease in soldiers aged 20 to 36 Race, nationality, and stock played no part in the incidence of the condition. Overweight was the most noticeable of the likely predisposing factors, and it was present in 91 per cent of the cases Vigorous effort and the activities of early morning chores brought on the fatal attack in half the cases, although in 10 per cent it commenced during sleep Atheroma formed the basis of coronary occlusion in all cases Atherosclerotic plaques in more than one coronary branch were found in 84 per cent of the series Myocardial scars were observed in 59 per cent, and recent infarction was noted in 19 per cent Significant cardiac hypertrophy was not found

Size of the Heart in Cardiac Infarction.—The change in the size of the heart in 16 patients following cardiac infarction was examined by E. Massie and W C Miller<sup>2</sup> by serial teleradiograms over periods extending from 12 hours to 7 months after the attack. Eight of the patients showed no change in any of the films. Although no characteristic change was found in the remaining 8 cases in which an increase of the cardiac silhouette was found in one or more films, the more frequent occurrence of complications within this group attracts attention. The finding of pulmonary congestion in the first and second weeks following the coronary accident was especially noteworthy, it was present in 12 patients although basal rales on auscultation were only present in 7 of these

REFERENCES -1 Amer med Ass 1944, 124, 1233, Amer J med Sci 1943, 206, 353

### CAROTID-BODY TUMOURS

Lambert Rogers, MSc, FRCS.

These tumours are comparatively rare and no surgeon can claim to have an extensive experience of them Von Haller described the carotid body in 1748, calling it the "ganglion minutum", and in 1862 Luschka reported its microscopical appearances The first extirpation of a carotid-body tumour with survival of the patient was that of Maydl, of Prague, in 1886, whose patient, however, was rendered hemiplegic and aphasic In 1889 Albert successfully removed one of these tumours without performing carotid ligation and without detriment to the patient, but recurrence took place within a Altogether about 250 cases have now been reported An excellent review has recently been published by J H Gratiot1 of Monterey, California, who summarizes our knowledge of the body and its tumours and adds two more cases of his own The carotid body occurs throughout the mammalia. In man it lies behind the carotid bifurcation, to which it is connected by Mayer's ligament, a fibrovascular band Its nervous connexions are with (a) the sinus nerve of Hering from the glossopharyngeal, (b) the superior cervical ganglion, (c) vagus, (d) hypoglossal The embryology and functions of the body are obscure It is not essential to life The tumours are slow growing, ovoid,

# PLATE X

### BURNS OF WAR

(CECIL P G WAKELEY)



Extensive deep burn of thighs legs, and margin, and buttocks, treated with uren formic todide and then skin grafted



smooth or bosselated, and on cut section greyish-red to deep purple in appearance. They have been variously classified, but they are best grouped as paragangliomas or simply called carotid-body tumours, they are at times locally malignant, the sexes are affected equally and the majority occur between 25 and 60 years of age. They usually manifest themselves as a swelling behind the angle of the jaw, only about 3 per cent produce the carotid sinus syndrome, and it is thought, therefore, that for its production a hypersensitive sinus is probably a requisite as well as a tumour. [The reviewer recalls an example of this syndrome produced by an enlarged lymphatic gland. The patient, a young woman, was in the habit of collapsing suddenly, e.g., in the middle of the road. She had a tumour related to the carotid bifurcation which was removed with the impression that it was a carotid-body tumour, but it proved to be a Hodgkin's node—L C R ]

Carotid-body tumours can sometimes be removed without interfering with the carotids—at other times it is necessary to perform carotid ligation, in which case it may first be advisable to ascertain the effect on the cerebral circulation by obtaining electro-encephalograms while the carotid is temporarily occluded (Lambert Rogers, 19442) Gratiot advocates dividing the operation in difficult cases into two stages, 10 to 20 days apart He gives the mortality as 10 to 20 per cent without and 30 per cent with common carotid ligation It is interesting to note that carotid ligation has been necessary in only 50 per cent of recent cases as opposed to 80 per cent in earlier days Probably about a quarter of the patients who survive have residual symptoms due to injury to adjacent structures or depletion of the cerebral blood-supply two cases occurred in a woman aged 38 and a man aged 27 In the first the tumour was removed in two stages without carotid ligation, in the second all three carotids and the internal jugular vein were ligatured without cerebral disturbance or other untoward effects and the patient is well and at work three years afterwards

References -- Surg Gynec Obstet 1943, 77, 177, Brit J Surg 1944, 32, 309

### CEREBROSPINAL FEVER. Thomas Anderson, M D, F R C P Ed

Epidemiology—The number of registered cases of this infection in England and Wales during 1943 was 3303 <sup>1</sup> This figure is almost a half of that for the previous year and a little more than a quarter of the total in 1941. The decline is thus steady, but the incidence still much above that prior to 1940 It is interesting to note that after the 1915–17 epidemic the incidence fell within three or four years to between 400 and 600 per annum. After the 1931–38 epidemic the decline was less spectacular and the annual incidence never returned to the pre-epidemic figure, but remained around the 1000 mark. There seems to be a trend, therefore, towards a higher inter-epidemic prevalence, and it may be that the figures for the next few years will reflect this trend. During the last three years the fatality-rates (based on notifications and deaths) have been 19 5, 20 0, and 28 6 per cent. Such a rise might suggest that as the epidemic wanes our 'awareness' of the disease also wanes, with a consequent delay in diagnosis

### Treatment.

1 Chemotherapy —Last year's Annual summarized the results of chemotherapy in several large series of cases, and little can be added that is new A report from the Department of Health for Scotland (T Anderson et al 2) places on record the results obtained in six of the large Scottish fever hospitals during the recent epidemic period, 2223 cases in all were analysed, of which 1762 received some form of sulphonamide —The fatality-rate for such cases was 16 7 per cent (2 5 per cent under 24 hours), which at first sight compares unfavourably

with the figures obtained in the South of England Two factors should be kept in mind in making comparison. In the first place nearly all meningitis cases are admitted directly to the fever hospitals in Scotland there are practically no admissions to the general hospitals, even of the fulminant type of case Further, there seems to be a higher proportion of young persons, in whom the prognosis is less favourable. For example, in P B. Beeson and E Westerman's English series (see Medical Annual, 1944, p 65) 45 5 per cent were under 15 years of age, in Scotland no less than 60 per cent of the cases fell into this age group. The more severe climatic conditions may also play a part, for 3 per cent of all cases showed pulmonary complications; and pneumonia was noted in 9 per cent of the deaths. The report emphasizes the importance of age in deciding mortality, which now occurs principally in those under 2 years and over 35 years.

- 2 Pencellin —D H Rosenberg and P A Arling<sup>3</sup> have used pencellin in the treatment of 71 cases of meningitis, 65 were meningococcal, 5 streptococcal, and 1 pneumococcal Only one patient (meningococcal) died The penicillin was given in the following way —
- a After complete drainage of the spinal canal 10,000 units in 10 ml isotonic sodium chloride was injected. Thereafter, 10,000 units was injected at 24-hour intervals until a sterile fluid was reported. When the patient was judged severely ill on a clinical basis, intrathecal injections were continued until the cerebrospinal fluid was bacteria-free for three successive lumbar punctures. In a few of the early cases the intrathecal dose was 15,000 units in 15 ml, saline but as this gave rise to meningeal irritation it was rapidly abandoned.
- b Parenteral therapy was begun by continuous intravenous drip, 5000 units per hour being given for the first 8 hours (The infusion fluid was 5 per cent dextrose containing 40 units penicillin per ml) Thereafter, divided intramuscular injections (15,000 units three-hourly) completed parenteral treatment. In a few very ill patients the initial intravenous therapy was stepped-up to 10,000 units per hour for the first 4 hours

The scales of dosage actually employed are indicated in the following table —

Route	Units (Trousands)					
	-10	80	50	-100	100+	TOTAL CASES
Intrathecal	23	29	10	2	1	65
Route	Units (Thousands)					Thomas Comme
	- 50	100	- 200	- 500	500+	TOTAL CASES
Intravenous and/or intramuscular	17	18	16	11	8	65

From the table it can be seen that comparatively small doses of the antibiotic were used. The patient who died was a very severe case, moribund on admission, and died in 38 hours despite 12 g sodium sulphadiazine parenterally, 55,000 units penicillin intrathecally, and 380,000 units parenterally. In the other meningococcal cases recovery was rapid as judged by disappearance of coma (only one beyond 48 hours) and subsidence of fever (22 normal between 8 and 72 hours). As regards the cerebrospinal fluid, 48 had positive cultures on admission. Of these 29 were negative after one intrathecal injection, 8 after two, 8 after three, and 4 after four injections. In four patients, however, early disappearance of meningococci was followed by later reappearance, and the authors suggest that the penicillin in the fluid cultured may have inhibited growth in the earlier specimen. Complications noted were 15 arthritis (8 aspirated and 1 positive for meningococci), 10 epididymitis with or without orchitis, 3 transient diplopia, 4 palsies of ocular nerves Localized thrombo-phlebitis at the site of intravenous injections was noted in 4 patients, 3 showed a transient mild urticaria possibly due to the penicillin

The 6 patients with meningitis due to other organisms all recovered Adequate parenteral therapy for such cases is stressed, especially if there is a local 'feeding' focus

[The striking feature here is the good effect obtained with comparatively small amounts of penicillin. It may be stressed that these results were obtained in Service individuals and therefore in the age-group which shows the best results with sulphonamides. But the report gives grounds for hoping that in penicillin a method of treatment has been found which will improve the prognosis in the very young age-groups.—T A ]

Chemoprophylaxis.—Several American publications have appeared which

suggest that the routine use of quite small amounts of sulphadiazine over a short period may effectively stem an epidemic of cerebrospinal fever. For example, D M Kuhns et al.4 record two experiments carried out in Army camps In the first, 8000 men in one community (amongst whom there had been 28 cases of meningitis during the preceding four weeks) were selected for prophylactic treatment, while 9300 men in another geographically separate community (who had produced 21 cases of meningitis in the preceding four weeks) were used as Just before the treatment was begun examination of a random sample showed 36 per cent of carriers in the former and 38 per cent in the latter Over three days a total of 9 g of sulphadiazine was given to all members of the first group In the ensuing eight weeks no cases of meningitis occurred, and the carrier rate fell to between 2 and 7 per cent In the control group, however, 28 cases of meningitis occurred, while carrier rates varied between 30 and 57 per cent Toxic effects from the drugs were negligible. In the second experiment, on different individuals, the dose of drug given was 4 g, 2 g on each of two days. The results were as good as in the first experiment. In the treated group only 2 cases of meningitis occurred, whereas in the control group during the same period there were 17 cases No toxic effects were observed A similar finding is recorded by F S Cheever et al. 5 who gave 8 g of sulphadiazine over 3 days and found that the carrier-rate was reduced from 79 3 per cent to 0 5 per cent in six days In a control group the carrier-rate actually rose from 58 1 per cent to 76 3 per cent. [These findings deserve the closest scrutiny Two pre-requisites would seem to be essential First, the community must be virtually a closed one it is doubtful if similar results would be obtained elsewhere Second, the whole of the community must receive the treatment at the same time R L Cecil's report (see INFLUENZA) suggests that the reduction of such carrier-rates is merely temporary —T A]

REFERENCES — Rep Min Hith 1944, \*Spec. Rep Dep Hith Scotland (HMSO, 1944), \*J Amer med Ass 1944, 125, 1011, \*Ibid 1943, 123, 335, \*Ann intern Med 1943, 19, 602, \*J Amer med Ass 1944, 124, 8

#### CHANCROID.

T Anwyl-Davies, M D., F R C P

After treating over 1000 cases of chancroid with sulphonamides, F C Combes, O Canizares, and S Landy¹ believe that protracted treatment is unnecessary, as after the lesion has become sterile continued chemotherapy does not materially influence the healing ulcer. These writers treated 94 hospitalized patients with chancroid with an initial dose of sulphathiazole, 2 g, followed by 1 g four times daily. A 3-day treatment consisted of 13 g, a 5-day of 21 g, a 7-day of 29 g, and a 14-day of 63 g. The results obtained during 5 days

gave the same results as treatment for 12 days or more A 3-day schedule was unsatisfactory In buboes, 7 days' treatment gave the same results as 14 days or more They conclude that sulphathiazole for 5 days (21-g) in simple chancroid, and for 7 days (29 g) if buboes are present, is adequate to cure chancroid

REFERENCE -1 Amer J Syph 1943, 27, 700

# CHEMOTHERAPY OF BACTERIAL INVASION: THE SULPHONAMIDES. R St A Heathcote, DM, FRCP

With the passage of time and the increase of experience, the position of the sulphonamides in therapeutics has become gradually stabilized. It is no longer to be expected that there should be in the future any great widening of their useful field of application, and, in fact, there has been little of this nature recorded during the last year. It may be hoped that new compounds may be synthesized which will be less liable to cause toxic effects than the older members of the group and that a wider recognition of the causes of these toxic effects may limit their rate of incidence.

While the use of sulphanilamide applied locally in septic or presumed septic wounds has now a standing of several years (Jensen, Johnsrud, and Nelson1), a more recent development was the substitution of sulphathiazole for sulphanilamide, as advocated on experimental grounds by Hawking 2 Sulphathiazole is less soluble than sulphanilamide and so will tend to remain longer in the area to which it is applied It is also more effective as a bacteriostatic agent and so should tend to produce better results Sulphapyridine is even more insoluble than sulphathiazole at the tissue pH and might be expected to be better still, but Hawking found that its very insolubility led to its being treated by the tissues as a foreign body and becoming sealed off McIntosh and Selbie<sup>3</sup> tried the effect of a mixture of 1 part of proflavine with 99 of sulphathiazole in vitro and in vivo It was found to be very effective against the pyogenic cocci, the three commonest wound-infecting clostridia, and several of the Gram-negative bacteria It was also found, when used in proper amounts, to be without deleterious effects on normal tissues This mixture has been applied to war and to civil wounds, both at home and abroad, with apparently excellent results (McIntosh and Selbie<sup>3</sup>, Figgetter<sup>4</sup>, Ascroft<sup>5</sup>) Sulphanilamide is soluble in diethyleneglycol It would be interesting to know if sulphathiazole, or the mixture of it with proflavine, is soluble in ethyleneglycolmonophenyl-ether, phenoxetol, in view of the remarkable effects of this last-named substance in infections with Ps puocuanea (Berry 6. Gough, Berry, and Still 7) It might well be that such a triple mixture could rapidly render raw purulent surfaces fit for skin-grafting

A comparison of the effects in pneumococcal pneumonia of sulphamezathine and of sulphapyridine has been made by Melton 8 The distribution of the cases was purely one of chance, the day of admission to hospital He treated 184 cases with sulphamezathine with 10 deaths, while his colleagues, using sulphapyridine, had 20 deaths in 179 cases The latter gives a case-mortality figure of 11 per cent, which might suggest that the disease was somewhat more severe than usual, as a more common value for the case-mortality is perhaps some 7 or 8 per cent The difference in the death-rate with the two drugs is, statistically, not significant The two drugs produced similar effects on the course of the disease, fever being abated in 45 per cent and a further 33 per cent in 24 and 48 hours, respectively, with sulphamezathine, as compared with 43 and 33 per cent with sulphapyridine One great advantage of sulphamezathine hes in its much smaller liability to cause toxic effects. Nausea was only occasionally experienced and very few patients actually vomited No cyanosis,

attributable to the drug, was observed. One case of skin-rash and two of drug-fever occurred. One case showed oliguria, but it is doubtful if the drug could be held responsible for it and urinary deposits of the drug or its acetyl derivative were not found. When everything is taken into account, there is good reason to believe that sulphamezathine is at least as effective as a curative agent in pneumonia as is sulphapyridine and far less hable to cause untoward side effects than the latter

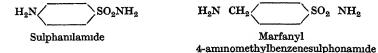
In view of some of the conditions necessarily associated with war in the Tropics, a comparison has been made of the effects of sulphadiazine and its mono- and di-methyl derivatives, sulphamerazine and sulphamezathine (Schmidt Sester, and Hughes<sup>9</sup>) As regards acute toxicity in mice, there is little difference between the three drugs, on the basis of lethal doses and the corresponding concentrations in the blood Sulphadiazine seems exceptional among the sulphonamides in producing delayed death, but the two methyl derivatives resemble the other members of the group, sulphathiazole, etc So far as prolonged administration is concerned, all three drugs produced comparable effects on the growth of the young, or the weight of the adult, animal The essential difference between the three drugs lies in their effects on the kidney pective of the concentration in the blood, sulphamezathine appears never to damage the kidney Sulphamerazine appears distinctly less harmful than sulphadiazine The critical factor here is probably the relative solubilities of the three drugs and/or their acetyl derivatives in acid urine, though it is not possible completely to exclude effects due to differences in tubular re-absorption or in toxicity for the tubular epithelium itself. The general conclusion of the authors is that both the new drugs are valuable additions to the group of the sulphonamides, provided that their antibacterial effects prove comparable to those of sulphadiazine, sulphathiazole, etc

In a second paper 10 the same authors attack this question of the antibacterial powers of these drugs They were compared, chiefly, with those of sulphadiazine and, to a less extent, with those of sulphathiazole The organisms used were pneumococci, streptococci, staphylococci, Friedlaender's bacillus, dysentery bacilli, and B coli Speaking generally, all three compounds showed a high level of chemotherapeutic activity against all the different organisms, with It was observed sulphadiazine showing a somewhat wider range of activity that, in infections for which prolonged treatment is required, sulphamerazine was generally somewhat more efficient than sulphamezathine, and vice versa in the case of shorter-lasting infections This may perhaps be correlated with the known differences between them as regards absorption and excretion Sulphamezathine gives higher peak and lower valley levels in the blood than on similar doses does sulphamerazine, which tends to show a more sustained level with less marked variations

As the three drugs all possess chemotherapeutic activity of a high order and comparable one with another, any of them might serve for therapeutic use Here, however, choice may be guided by other factors, such as toxicity—Sulphamerazine is better than sulphadiazine, as it has less renal toxicity, and sulphamezathine is better still—On the other hand, it is not easy to maintain an appropriate blood concentration with either sulphadiazine or sulphamezathine. The conclusion to which the authors come is that there is little to choose between the three, but that particular factors might lead to the selection of any one drug in a given case, e.g., a known case of renal disease would preferably be given sulphamezathine—They point out, incidently, that vast differences exist between the absolute amounts of drug required to cure different infections. There is, it must be admitted, a tendency in practice to have a standard posological treatment for each sulphonamide and to adhere to that standard, regardless

of the organism present in each case. They suggest that it may be possible to cut down dosage in certain infections, and thereby to limit the risk of appearance of toxic ill effects.

Marfanyl.—Among the "prize of war" in N. Africa was a quantity of a drug called 'marfanyl' This is a substance which is, chemically, closely related to sulphanilamide, differing from the latter only in that the amino group is attached to the ring, not directly, but through a methylene group, thus —



The inhibiting effect of p-aminobenzoic acid on the antibacterial effect of the sulphonamides is so characteristic and so essential that it has been claimed that no substance, whatever its chemical structure, can belong chemotherapeutically to the sulphonamide group unless its antibacterial activities are inhibited by p-aminobenzoic acid. This very small difference in structure between sulphanilamide and marfanyl is sufficient to bring about a most important change in the nature of their antibacterial action, as Fleming<sup>11</sup> has shown that marfanyl does not lose its activity in the presence of p-aminobenzoic acid or of pus

The compound is not new, as it was tested in the USA some years ago and rejected (Miller, Sprague, Kissinger, and McBurney<sup>12</sup>) on the grounds of its low degree of efficiency in protecting mice from streptococcal infection. Its peculiar property of retaining its activity in the presence of sulphonamide inhibitors was not then recognized. Again, its bacteriostatic action is low in comparison with that of, say, sulphathiazole. It was used in a small number of casualties in N. Africa, and the authors of the report (Mitchell, Rees, and Robinson<sup>13</sup>) were greatly impressed by its good effects in old infected wounds and burns. In fact, they regard it as second only in value to penicillin. The synthesis of the drug, according to an editorial in *The Lancet*, <sup>14</sup> is somewhat difficult, which is to be regretted

It would certainly be most interesting to know if its weak bacteriostatic action could be enhanced, as is that of sulphanilamide, by variations in the sulphanamide part of the molecule. Thus, a pyrimidine, thiazole, or pyridine ring could be linked on to the amide introgen atom and so there could be prepared the analogues of sulphadiazine, sulphathiazole, and sulphapyridine. If this enhancement of activity occurred, as it might well do, and if the property of retention of antibacterial activity in the presence of sulphanamide inhibitors were not lost, these might prove to be very useful drugs indeed

REFERENCES — Surgery, 1989, 6, 1, \*Lancet, 1942, 2, 507, \*Ibid 1944, 1, 591, \*Ibid 598, 5Ibid 594, \*Ibid 2, 175, \*Ibid 176, \*Ibid 1, 277, \*I Pharmacol 1944, 81, 17, \*Ibid 43, 11 Report to MRC on Marfanyl, 1943, cited by Mitchell et al , \*IJ Amer Chem Soc 1940, 62, 2099, \*ILancet, 1944, 1, 627, \*IEditorial, Ibid 635

CHEMOTHERAPY, INTRAPERITONEAL. (See Intraperitoneal Chemotherapy)

CHEST, SURGERY OF, ARRHYTHMIA IN. (See ARRHYTHMIA)

### CHEST WOUNDS. A Tudor Edwards, M Ch, F.R C S

The treatment of wounds of the thorax seems to be reasonably well established To a large degree the early treatment should be conservative, with the exceptions of (1) Open 'sucking' wounds, (2) Wounds with continued

intrapleural bleeding, (3) Very large hæmothorax; and (4) Tension pneumothorax

As has been suggested in a previous number of the Medical Annual, the closure of the open 'sucking' wound by a vaselined gauze pack covered by adhesive strapping is probably the best method to be adopted in forward areas, or excision and suture of the muscular layers, leaving the skin open with sutures inserted for later tying, may be advisable if much laceration is present and operative conditions are reasonably good. Complete suture almost always results in infection and subsequent open pneumothorax, and should be avoided. Obviously with continued intrapleural bleeding open operation should be performed as soon as facilities are available. Aspiration of a large hæmothorax causing dyspicea and cardiac distress is essential before allowing a patient to travel, the amount of blood removed need only be sufficient to permit return of the heart to a normal position, and not to remove all the pleural contents, which can be done later. Tension pneumothorax will require immediate relief, and may need the continued presence of a needle in the pleura

Several papers have appeared during the last year from A L D'Abreu et al, 1 W J Nicholson and J G Scadding, 2 and R B Scott 3 The first records the complications in 260 patients, Nicholson reviews 291 patients, and Scott 127 patients The mortality is 5.7 per cent in D'Abreu's series and 6.5 per cent in Nicholson's group, but the latter demonstrates that hospital mortality figures must be grossly affected by selection of cases arising from the delay between wounding and admission to hospital Thus, he shows that in cases in Group 1 (admitted 1-3 weeks after wounding) the mortality was under 8 per cent; in Group 2 (admitted 1-2 days after wounding) it was 12 per cent; and in Group 3 (admitted 2-3 days after wounding) it was just under 8 per cent

The incidence of infection in hæmothorax in D'Abreu's cases was 33 per cent, and in Nicholson's 30 per cent They both lay stress on the value of early and repeated aspiration

The cause of clotting in a hæmothorax is still indeterminate, Nicholson considers that tissue damage is an important factor, and also delay in aspiration, infection, or intrapleural foreign body D'Abreu considers infection the chief factor.

Scott and Nicholson advocate the prophylactic use of sulphonamides, whereas D'Abreu has had the advantage of the use of penicillin. As regards penicillin, in an experience of 70 cases he considers it much more valuable than sulphonamides when the infecting organisms are clostridia or Gram-positive pyococci. He states that an infected empyema can be sterilized by intrapleural instillations of sodium penicillin (30,000-60,000 units in 2-4 oz saline) after aspiration of the effusion, and frequent changes of posture of the patient in bed to allow the fluid to reach all the recesses of the cavity. As active penicillin is found after forty-eight hours the aspiration and injection do not need to be carried out more frequently. Local instillation has proved more efficient than parenteral administration, as even after an 8-day course of parenteral injection penicillin has not been found in the pleural fluid. In septic wounds of the chest wall, excision and suture can be carried out associated with parenteral penicillin (sodium penicillin 15,000 units 8-hourly) and has resulted in 90 per cent primary union

The complications recorded by these authors, apart from pyothorax, are atelectasis, lung abscess, bronchopleural fistula, chylo-thorax, pericarditis (non-suppurative and suppurative), cerebral abscess, and thoraco-abdominal wounds. Of the latter, D'Abreu records 84 in the series, and Nicholson 25.

In both groups it is clear that the prognosis is good in survivors past the casualty clearing station level, or admitted to advance base hospital Of 5

seen by Nicholson within twenty-four hours of injury, 3 died. D'Abreu had 3 patients with pleuro-bihary fistulæ, and 4 had associated subphrenic abscess. Certain American surgeons working in the Pacific area appear to be less concerned with aspiration of a hæmothorax than do either their colleagues over here or British surgeons. E. Holman's does not consider it essential unless there is definite dyspicea, and then only enough fluid is aspirated to relieve the distress. Holman records only 36 cases, and in some of these aspiration had been performed early, but unless some absorption results in two or three weeks, he considers that hæmothorax warrants neither operation nor aspiration.

References — Lancet, 1944, 2, 197, \*Ind 1, 299, \*Brit med J 1944, 1, 490, \*Ann Surg 1944, 119, 1

CHILDREN, MENTAL DISORDERS IN. (See MENTAL DISORDERS IN CHILDREN)

### CHOLESTEATOMA OF THE PETROUS BONE.

F W Watkyn-Thomas, FRCS

In the Medical Annual for 1939 (p. 154) reference was made to a series of cases described by G Jefferson and A J Smalley in which progressive facial paralysis was produced by "intratemporal dermoids" J Pennybacker1 describes 3 similar cases In each of these 3 cases facial paralysis came on slowly and painlessly, in 1 case with violent recurrent facial spasm, so severe as to raise a suspicion of epilepsy. All three patients came to treatment on account of the palsy and not for the deafness. In 1 case there had been an attack of acute otitis media three months after the onset of the palsy, in the other 2 there was a history of aural suppuration many years before It is remarkable that, as Jefferson had noticed, in all three cases there was no true nerve deafness-1 case of "mixed", 2 of middle-ear deafness In Jefferson's series of 6 cases there was only one true nerve deafness. In all three cases there was loss of the cold caloric reaction on the affected side, this again agrees with Jefferson's findings—lost in 4 cases, minimal in 1, normal in 1 Pennybacker attacked the cholesteatoma by the intracranial route used for division of the trigeminal nerve, so does not mention the labyrinth erosion described in Jefferson's cases, which were dealt with by the extended radical mastoid method Even so, it is difficult to explain the predominant middle-ear deafness, which seems characteristic of these cases Unfortunately, the history of previous aural suppuration in 2 cases of Pennybacker's forbids us to claim them as proving the origin of these growths independent of aural invasion, but the history strongly suggests that probability

[The intracranial approach which Pennybacker used seems to have certain disadvantages as compared with the mastoid route. In the case, however unlikely, of recurrence there is no permanent orifice through which an accumulation can be removed, and investigation of the bony labyrinth is not so easy, it would be quite possible to miss a sequestrum of the lower labyrinth by the upper approach. Such a sequestrum was found in one of Jefferson's cases—F W W.-T]

REFERENCE -1Brit J Surg 1944, 32, 75

# CHRONIC 'RHEUMATIC' DISORDERS.

Nutritional Deficiency in Aetiology of Rheumatoid Arthritis.—Claims for an aetiological connexion between vitamin deficiency and rheumatoid arthritis have cropped up here and there for some years past but have never been substantiated T B Bayles and others have carefully studied diets of

arthritics for a year prior to the onset of the disease. Although many showed a dietetic deficiency others did not, and in many cases there was no difference between their diet and that of healthy families taken for comparison. They conclude that if a food-factor deficiency contributes to the onset of rheumatoid arthritis it must be caused by an increased total requirement of the patient rather than in a deficiency in his actual diet.

Gold in Rheumatoid Arthritis.—The advantage of small doses is stressed by W B Rawls2 and others, who refer to Hartung's findings that the bacteriostatic property of the sera of patients who had received 150 mg gold was similar to that of patients who had 900 mg in the same period (6 weeks) is drawn also to Freyberg's determinations of the concentration of gold in plasma and its elimination in urine and fæces He concluded that (1) With increasing doses of gold, there was an increase in blood-gold level and urinary excretion, followed by a levelling-off, even though greater retention may have been taking place (2) When injected weekly, the amount of gold eliminated did not exceed 25 per cent of that injected at any one time (3) The higher the dose, the greater the urmary excretion (4) Gold was still in blood and urine 9-12 months after injections, the length of time being approximately proportional to the size of the weekly dose Thus, after a weekly dose of 125 mg, gold was in blood and urine for 1 month, after 25 mg, 3 months, after 50 mg, 6-10 months (5) Toxic reactions were more frequent and severe in those who had large weekly injections (6) With smaller doses the same therapeutic results were obtained The tentative schedule adopted was 5 mg. intramuscularly twice a week for 3 weeks, 10 mg twice a week for 3 weeks, and then 25 mg once a week If toxic symptoms did not develop after 3 weeks of the latter dose, they rarely appeared subsequently Most of the patients were given 25 mg a week throughout the series, but in a few cases that showed no improvement after 4 weeks the dose was increased by 5 mg every 2 weeks until improvement occurred or until 50 mg a week was reached For example, if improvement occurred on 35 mg a week, the dose was not increased further However, if the improvement did not continue the dose was again increased but never above 50 mg They did not give a definite course of injections but were able to prevent the relapses that so frequently occur with the standardized course method In spite of these small doses 42 per cent developed toxic symptoms, 50 per cent of which occurred before 100 mg had been given and 86 per cent before 200 mg The percentage is high, but it is claimed that because the dosage is so small the signs of toxicity will quickly recede and nothing serious or prolonged will occur as would be the case with large doses There seems to be a parallel between the total dose and the toxic reaction per individual, because if he is allowed to excrete the gold fully a further course will, as a rule, produce the same reaction at the same point 
If started before full excretion, then this will occur earlier They state that the course can be given for a year, with a pause in the event of toxic reactions This prevents the The results in over 100 patients were 58 per cent relapses of the usual method markedly improved with almost complete remission, 21 per cent definitely improved, and 12 per cent slightly improved. In almost, but not quite, all there was a reduction of the ESR

It is interesting to compare these remarks with those of A Cohen and A W. Dubbs, who used the same preparation of gold, but the more usual dosage of 10, 25, and 50 mg doses bi-weekly for 2 doses each, and 100 mg weekly for weeks, with a course in dosage of 124 g A second course was given after a 6-week interval, no matter what had been the result of the first (toxic reactions excluded). Some were given a third course Of 122 patients 36 per cent were

very much improved, 17 per cent were much improved, 35 per cent subjective improvement only, 9 per cent no change, and 4 per cent were worse. The percentage of toxic reaction was 9 8 per cent for the first course, 18 per cent during the second course, and 6 per cent during the third course, giving 11 per cent in 126 courses of treatment. They attribute their low toxicity figures to the administration during treatment of large doses of fruit juices for vitamin C, to the use of liver (4-lb thrice weekly) for vitamin B complex, and to their caution in the face of any evidence of untoward reactions

It will be seen that demonstrable benefit was produced in 53 per cent as compared with 74 per cent to possibly 86 per cent of patients treated by the minute dose method, whereas their toxic reactions were 11 per cent compared with 42 per cent. This comparison must not be taken as conclusive evidence of the benefit of one or other method, for better results have been obtained by other workers in the past using relatively large doses, and there is no conclusive evidence that high vitamin intake does, in fact, render patients less prone to toxic reactions

The difficulty in establishing criteria of "improved," "much improved," and so forth seems to be insurmountable, and thus vitiates any attempt to compare the results of one worker with another. It would be best if a complete disappearance of signs and symptoms, and return of E.S.R. to normal, were taken as the standard for "greatly improved," and on that alone should comparative tests of efficacy of method, or of drug, be based. This would limit the field of appraisal to early cases, but would not interfere with the therapeutics of the more advanced instances of the disease

A H Douthwaite reports disappearance of symptoms and signs of activity of rheumatoid arthritis following gold treatment in 70 per cent of 200 cases, but notes that relapses occur in the majority of those subjected to only one course of injections—usually 0.8 g. Four courses in two years appear to eradicate the disease in 55 per cent, but the possibility of recurrence years afterwards forbids the use of the word "cure". The same writer notes that toxic reactions in the first years of the use of gold used to arise in about 45 per cent of cases, but they have now fallen, partly because of reduced dosage and possibly because of the use of calcium aurothiomalate, to 10 per cent. Reference to this drug was made in the Medical Annual of 1944 and 1943.

Bismuth in Rheumatoid Arthritis.—In the same article Douthwaite reports on the experimental use of injections of bismuth and bismuth salicylate for rheumatoid arthritis. He concluded that (1) Bismuth by intramuscular injection appears to be capable of exerting a beneficial influence on the course of rheumatoid arthritis, (2) It compares unfavourably with gold in this respect, the probability of lasting benefit being less than half that expected from gold, (3) Relapse appears to occur more quickly than that following gold, (4) Gold-resistant arthrities are unlikely to benefit from bismuth.

Prostigmine in Rheumatoid Arthritis.—P R. Trommer and A Cohen<sup>5</sup> claim good results in overcoming muscular spasm and thus increasing range of movement in quiescent rheumatoid arthritis. They use prostigmine combined with atropine to counteract the effect of the former drug on the parasympathetic nervous system. They attribute the benefit to a depressant action on the spinal cord.

Ulnar Deviation of Fingers.—This common, unsightly, and crippling deformity is due in the first place to inflammatory weakening of the capsules of the metacarpophalangeal joints, and stretching of the ligaments and muscle wasting. All this allows of abnormal mobility. Once this has been produced it is probable that the most important influence in causing the deviation is the

effect of gravity If the usual position of the arms of the arthritic be visualized, it will be at once appreciated why this is so. No doubt the wasting of the interessei and the relatively greater strength of the flexor muscles play a part in the deformity, but this influence has been over-stressed in the face of the obvious

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In the acute stage the affected joints should be immobilized in plaster splints. If this were done oftener we should see less permanent deformity. Where no such check to ulnar deviation has been made, then the restoration of normal alinement is most tiresome and often impossible. D. C. Bodenham<sup>6</sup> has



Fig 18 — a. Correction maintained throughout full range of flexion, the fixation screws are in position in the half-length arm plaster b, Correction maintained in extension (By kind permission of 'The Lancet')

devised a comparatively simple splint for this purpose as the disease is quiescent, a stage often obtained in a few weeks with gold treatment. The splint is attached to screws whose heads are embedded in a plaster splint applied to the distal forearm and wrist. The accompanying illustrations (Figs. 18, a and b) show its general construction and mode of action, which allow of exercises in the right position to permit restoration of muscle bulk and power. Such an achievement will, if no gross damage is done, allow of resumption of function of the interesser and extensors so that the splint may be discarded without fear of relapse

Ankylosing Spondylitis.—E Fletcher claims that this disease is on the increase, and is able to base his account on 68 cases. The most arresting statement is that, of these, 32 were females He is at a loss to explain such a difference of incidence as compared with the experience of others, notably

Buckley, who found 20 females in a series of 150 patients Fletcher gives four groups based on radiological standards —

17
10
30
8

It will be seen that Group A is the second largest of the series. By "sacral focus" is meant a destructive lesion of the sacro-iliac joint which first shows itself as an irregular widening of the joint surfaces with apparent serration of their edges. The decision as to whether early pathological changes are present in a sacro-iliac joint is extremely difficult to make. Many highly experienced radiologists frequently fail in this respect. Unless, therefore, widespread confirmation of a sudden increase of female ankylosing spondylitis is forthcoming it would be wise to suspend judgement on the matter. Compare H J N Dekkers' reports of 120 cases observed from 1931 to 1940, of which 110 were men and only 10 were women.

Chrome Polyarthrits and Trauma.—The occurrence of arthritis in a joint previously injured is well known. The common form is osteo-arthritis, which shows itself many months after the injury. Less often the appearance is that of infective or rheumatoid arthritis and is usually associated with the presence of some obvious focus of infection. The explanation of this event is taken to be that the trauma produces local lowering of tissue resistance microbes entering the blood-stream from the focus will find such an area a haven wherein they can multiply. That a causal connexion can exist between polyarthritis and trauma is debatable, it is also of great medico-legal interest in relation to compensation of workmen. E. Ryden reports 19 cases of trauma to, or near, a joint being immediately followed by local arthritis, and, after a period of a few days to a few weeks—usually the latter—involvement of many joints by a chromic inflammatory reaction. In nearly every case there was gross focal sepsis present. It is suggested that the multiplicity of the arthritis is an allergic extension to the infection of the first joint.

Dysenteric Arthritis and Trauma.—That trauma may be the determining factor in production of arthritis of infective nature is shown by N J Bonnin and H B Kay<sup>10</sup> in relation to dysentery carriers. Several of their patients had had mild diarrhoea several months previously. Slight injury to a knee-joint was soon followed by aching pain, moderate effusion, rise of local temperature, and striking absence of acute local tenderness or severe pain on movement. Swabbing of the bowel nucosa revealed Flexner bacilli. The arthritis subsided when the treatment of the bowel infection was successful. Failing this no improvement occurred from local treatment of the joint.

Local Treatment of Arthritic Joints.—We have had occasion in the past to refer to intra- or pen-articular injections of various medicaments in the treatment of chronic arthritis. A year seldom goes past without further suggestions of this sort. The search for effective local anodynes is stimulated by the frequency with which even in extensive rheumatoid arthritis one or two joints are outstandingly painful and remain so although the disease may be arrested. It is difficult, however, to see how any but unabsorbable substances can exert more than fleeting benefit. R. T. Kennedy, 11 basing his experiments on the view that the organisms from septic foci are in fact also present in joint tissues and their lymph-glands, has boldly implanted under the subcutaneous fat of the legs and thighs, below and above affected knee-joints, sterilized sulphanilamide powder (2 drachms by weight), and reports remarkable improvement in two cases in which the disease was largely confined to the soft tissues

H W Crowe<sup>12</sup> injects into the joint 1 per cent acid potassium phosphate in isotonic saline. The reason for the procedure appears to be that the fluid of a chronic synovitis is alkaline, whereas in the acute joint [sic] it is acid. Even if this be true it is difficult to follow the line of reasoning which leads to the treatment recommended. He reports on a series of 280 painful and swollen rheumatic joints (osteo-arthritis, rheumatoid arthritis, mixed arthritis, arthritis associated with spondylitis adolescens, and traumatic arthritis). He states that one injection is usually sufficient, and that lasting improvement was obtained in three-fifths of the cases and temporary relief in all the remainder but one. The period over which "lasting improvement" was observed is not given. That the pain of widely diverse forms of arthritis can be removed in such a miraculous fashion is a statement which must give rise to considerable scepticism.

Fibrositis.—Copeman<sup>18</sup> suggests that fibrositic nodules are sometimes the legacy of acute infections in earlier years and that they may lie dormant until activated by chill, trauma, or focal sepsis He bases this hypothesis on observations of influenzal victims suffering from the characteristic pains of the disease He found that the acute lumbar pain was associated with tender myalgic spots or nodules indistinguishable from those of ordinary lumbago Although the pain might disappear in a few days, yet in several patients the tender spots could be found many weeks afterwards Should they develop some other infection, eg, mumps, sandfly fever, or coryza, the pain of the fibrositis returned temporarily Many of the acute infectious diseases apart from influenza are associated with muscle pain and tender nodules which, again, often persist for months after the pain has subsided Whereas the accuracy of the observations can be accepted, the conclusion opening this paragraph is open to grave doubt The point is that there is no evidence that the patients prior to influenza or other infectious disease had not already dormant fibrositic nodules It seems to the reviewer that all Copeman has emphasized is that various acute infections may be associated with "rheumatic" nodules which may persist without causing discomfort. The study of the aetiology of the nodule is not clarified

An important contribution to the study of tender areas or nodules in muscles is provided by F A Elliott 14 He investigated tender nodules in the muscles of the buttock and calf of 14 cases of sciatica, all of which proved at operation to have a prolapsed intervertebral disc. These nodules were clinically indistinguishable from those attributed to fibrositis Pressure on them would aggravate the sciatic pain, and their injection with procaine would relieve or abolish the pain for several days. The tender spots were confined to muscles innervated by the affected root Elliott believes that the tenderness is not a referred phenomenon dependent on an excitable condition of a portion of the cord, but is due to local muscular spasm arising from irritation of the nerveroot He quotes the instance of a firm and tender lump in the trapezius which ' had persisted for several weeks In order to explore this a general anæsthetic was given and the lump disappeared and no trace could be found at operation In short, a persistent local spasm had been responsible Confirmation of this view seems to be provided by the author's experiments with an electromyograph He has shown that the insertion of a needle electrode into normal muscle provokes a momentary contraction of a few fibres, whereas its insertion into a tender nodule produces a more sustained discharge of action potentials which lasts as long as the needle remains in the muscle Reasons are adduced to show that this is due to involuntary spasm of small groups of muscle fibres

The importance of this work is that, if confirmed, it shows that nodules indistinguishable from those of fibrositis may owe their existence to nerve-root

irritation and not to inflammatory reaction in the muscles or their connective tissue

Sciatica.—It is doubtful whether the controversy over sciatica will be satisfactorily settled until a completely safe method of myelography is devised. That the incidence of ruptured intervertebral disc is much higher than at first supposed seems clear. W P U Jackson, 15 analysing 100 cases of sciatica, finds that 20 were due to local fibrositis, 21 were of doubtful origin, and ruptured disc was responsible for 18 The majority of all the symptoms and signs may occur in any group and no one is pathognomomic

It is becoming abundantly clear that many patients with sciatica arising from a ruptured disc will recover if treated by immobilizing the lumbar spine in a position of extension probably only the minority need operation (See also Radiology)

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# COLON, SURGERY OF. (See also Polyposis of the Colon in Children) A Rendle Short, M.D., FRCS

Simple Ulcer of Cæcum.—Only about 50 examples of this disease have found their way into the literature, but no doubt many surgeons have seen one or two cases [I have seen two —A R S] C Rosser, of Texas, has met with it in two patients. Males in middle life are the usual subjects Perforation is common In other cases there is great thickening of the cæcum A preoperative diagnosis is scarcely possible, it may be confused with appendicitis, carcinoma, or tuberculous cæcum The treatment is resection of the right colon Even at operation the diagnosis is difficult

Diverticulius.—É. L Young,<sup>2</sup> of Boston, presenting a study of 84 cases, reports that blood was found in the stools in 26 per cent, which is much more frequently than in the experience of other surgeons. Conservative treatment should always be followed, if possible, in preference to surgery. Barium sulphate, either by mouth, or, better, by enema, gives relief in a high percentage of cases. When an operation must be done, the simpler it is the better

Fæcal Fistula.—A statistical study of 408 cases of fæcal fistula treated at the Mayo Clinic is presented by A L Lichtman and J R McDonald 3 The commonest causative factors were appendicitis (99), regional enteritis or ileocolitis (71), tubo-ovarian inflammation (49), carcinoma (35), and diverticulitis As a rule, a fæcal fistula, especially following removal of the appendix, will heal spontaneously in a few weeks, it may heal after six or even twelve months Time should be allowed for this Of course, if the bowel is obstructed distal to the fistula, it is not likely to close. Sometimes it is kept open by foreign substances such as cotton fibres, lycopodium, or talc Duodenal or jejunal fistulæ may be treated by continuous suction Surface excenation can be prevented to some extent by applying beef broth and Witte's peptone, or milk powder, or 10 per cent tannic acid. As the operation to close these fistulæ may be formidable, the patient must be as fit as possible, and his protein, carbohydrate, electrolyte, fluid, blood, and vitamin reserves are estimated and corrected Inflammatory reaction around the opening is improved by rest in bed, and the use of a 5 per cent sulphathiazole ointment Succinyl-sulphathiazole given by mouth (2 to 4 g six times a day for three days) may help Even at the Mayo Clinic recurrences after operation were not infrequent (after appendicitis, 4 per cent, after regional enteritis, 178 per cent, after diverticulitis, 31 per cent) 'Lip' fistula responds to extra-peritoneal closure Fistulæ arising in granulomatous lesions of the bowel require resection. For really severe suppurative, saccular fistulæ, a pre-liminary colostomy is very valuable. "The intraperitoneal use of 5 to 10 g of sulphathiazole (or sulphanilamide) has dramatically reduced the incidence of post-operative peritonitis." If possible, the omentum should be sewn over the suture line in the bowel wall

REFERENCES — Ann Surg 1944, 119, 377, New Engl J Med 1944, 230, 38, Surg Gynec Obstet 1944, 78, 449

CONGENITAL HEART DISEASE. (See HEART DISEASE, CONGENITAL)

CONGENITAL TORTICOLLIS. (See TORTICOLLIS, CONGENITAL)

CONJUNCTIVA, DISEASES OF. (See also Eye Infections—Treatment by Penicillin)

Str Stewart Duke-Elder, M D, F R C.S

Ophthalmia Neonatorum.-In a general way it is usually accepted that acute purulent conjunctivitis in newborn infants is usually either gonococcal or staphylococcal A generation ago the gonococcus held the first place, but since the wide use of prophylactic drops of silver nitrate most investigators have found that other organisms such as the staphylococcus or the pneumococcus occur more frequently A considerable proportion of cases, however, show no-or no significantly pathogenic-bacterial flora, and the majority of these show on conjunctival scrapings the presence of inclusion bodies, similar bodies being recoverable from the cervix and vagina The occurrence of such an infection is not a new concept Intracellular inclusion bodies were demonstrated by Stargardt in 1909 in the conjunctival epithelium in a case of bacteriologically negative ophthalmia neonatorum, while Lindner, of Vienna, in the same year made considerable investigations on the subject. Of late years, however, with the development of the study of viruses, our knowledge has grown apace, and it is now possible to summarize with considerable authority the essential characteristics of the condition, particularly in view of the recent work of Thygeson and Stone<sup>1</sup>,<sup>2</sup> (1942-3) and Braley<sup>8</sup> (1942) in the United States, McKec4 (1942) in Canada, and more recently by Sorsby, Hoffa, and Young<sup>5</sup>, 6 (1944) in London

This inclusion type of ophthalmia neonatorum (inclusion blenorrhea of the newborn) has been given an incidence varying from 8 to 34 per cent of all cases of ophthalmia neonatorum (0 1 to 1 5 per cent of all births) in New York, and of 104 per cent of ophthalmic cases in London Its onset is usually about the 7th day after birth, but varies from the 2nd to the 20th day. In more than half the cases the condition is bilateral, usually with fairly profuse purulent discharge, sometimes with marked swelling of the lids, but rarely with corneal involvement, but as a general rule the affected eyes do not show any clinical features distinguishing them from other cases of ophthalmia neonatorum. The diagnosis is made by the discovery of intracellular elementary bodies in a conjunctival smear and in the absence of other significant organisms virus is morphologically indistinguishable from the trachoma virus, with its cycle of free elementary bodies entering the cytoplasm of an epithelial cell, swelling to an initial body, dividing to form initial bodies of large size, and further subdividing to form smaller elementary bodies, which grow to occupy much of the cytoplasm, from which they ultimately burst to escape as free initial bodies in the surrounding secretion. Attempts to cultivate the initial bodies have so far failed The origin of the infection is genito-urinary and the virus may be demonstrated in cervical scrapings from the mother, it has also been demonstrated in the male urethra Treatment is by sulphonamides, to which the response is as excellent as that obtained in ophthalmia neonatorum of bacterial origin, and there does not seem to be much obvious difference in the effects of different drugs of this group. Thus, in a series of 27 cases reported by Sorsby, Hoffa, and Young<sup>6</sup> (1944), 6 showed clinical cure within 1–3 days, 18 required 4–8 days, and the remaining 3 from 9 to 30 days. The sulphonamides were used by mouth and were as follows—sulphapyridine in 10 cases, sulphathiazole in 6, sulphamezathine in 5, sulphadiazine in 3, and in 2 cases two or more preparations were used

(See also GONORRHŒA, OPHTHALMIA NEONATORUM)

Angular Conjunctivitis—A note regarding an interesting observation by Valentine and Edwards<sup>7</sup> (1944) may be of value. It concerns the treatment of angular conjunctivitis, a recalcitrant infection of the conjunctival sac due to the Morax-Axenfeld diplobacillus, tending to occur in epidemics. Dealing with such an epidemic of 10 cases, they instilled 1 minim of 0.15 per cent propandine into the conjunctival sac after irrigation with boracic lotion. The clinical results were striking, discharge ceasing in 2-6 days and a cure being obtained in each case in less than 14 days.

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### CONTINUOUS CAUDAL ANÆSTHESIA IN MIDWIFERY.

Chifford White, MD, FRCP, FRCS, FRCOG

In 1901 Sicard and Cathelin in France used the sacral hiatus as an approach to the extradural space for injections of cocaine to block the nerves transmitting pelvic pain. In 1941 R. A. Hingston, W. B. Edwards, and J. L. Southworth introduced continuous caudal anæsthesia through the sacral hiatus as a modification of Lemmon's continuous spinal anæsthesia and published a series of cases early in 1942. This communication attracted much notice, and the method has been used in over 160 clinics in the United States, as well as in many other countries. The lay press took the matter up and published over 100 articles which have given the public an erroneous view of what the procedure can do. In these circumstances it is of importance to put on record the results of large series of cases, and a "Caudal Anæsthesia" number of the American Journal of Obstetrics was published in March, 1944. The results published vary according to the experience of the operator and the amount of team work possible, but everyone agrees that the method is only suitable for use in a fully staffed hospital

C O McCormick, C P Huber, J F Spahr, and C F Gillespie<sup>2</sup> give details of 100 cases in which a 1 5 per cent solution of metycaine (Lilly & Co) was used The largest amount used was 1030 c c (i.e., 15 g of metycaine), and the mother and child did well. Forty per cent of the patients were completely relieved of pain and 40 per cent required supplementary anæsthesia, in the remaining 20 per cent it was a complete failure. These poor results were partly due to the inexperience of the operators. A fall of 20 points in the systolic blood-pressure occurred in 15 per cent of the patients, and 2 Cæsarean section cases had respiratory and vascular collapse, but recovered with treatment. There were no maternal deaths, but the uncorrected stillbirth and neonatal deaths were 5 in number. They had the usual experience that it was difficult to prolong the anæsthesia for more than 6 hours.

There are two methods of introducing the solution which have been extensively used one is to insert a No 17 gauge malleable steel needle into the hiatus and leave it in situ, the alternative is to insert a No. 15 gauge needle, thread it with a No 5 ureteric catheter and withdraw the needle, leaving the

catheter in position for the injection of the anæsthetizing solution McCormick used a needle in 80 cases and a catheter in 20 cases. The advantage of the special malleable steel needle method is that there is less apparatus to assemble, clean, and sterilize, and a smaller object enters the sacral canal and so there is less chance of leakage of fluid through the sacro-coccygeal ligament. The great disadvantage is that the needle may break, especially in the case of a restless patient. The advantages of the catheter are that there is less risk of damaging the dura, and the patient can lie on her back and is more free to move, which might be an advantage if an eclamptic fit occurred. The disadvantage of the catheter is that it requires a larger needle, which is more painful to the patient unless efficient local anæsthesia is used. It is also more difficult to insert In general, most operators seem to prefer the needle to the catheter.

Among other advantages from continuous caudal anæsthesia, McCormick et al mention unusual relaxation of the cervix and perineum, thus shortening the first stage of labour and facilitating rectal (instead of vaginal) examinations, and that the child usually cries immediately on delivery, the absence of narcosis being specially favourable to a premature child They agree that it is not a suitable method to be used in the patient's home as "not only must the attendant report early in labour to insert the needle or catheter, but he must remain close in attendance throughout the period of anæsthesia, not alone to administer the anæsthetic but to check carefully the level of the cutaneous anæsthesia" The invasion of the caudal canal involves certain risks and must be regarded as a major surgical procedure. Even in expert hands it fails in 9 per cent of cases (R. A Hingston and W B Edwards<sup>3</sup>) Bladder complications are frequent, it is difficult to maintain anæsthesia for more than 6 hours, the second stage is long as the mother cannot help by straining, a fall of blood-pressure is usual, and laminectomy has been required to remove broken The risk to the mother is a definite one, 12 deaths having been recorded in 30,000 cases (R A Hingston4) of continuous caudal anæsthesia, but all these deaths were not due to the method of anæsthesia, and the results are much better than those previously obtained by single injections into the With single caudal injections 6 maternal deaths occurred out of sacral hiatus 4800 cases, all occurred quickly from respiratory failure and were attributed to puncture of the dura and injection into the subarachnoid space But even 12 deaths out of 30,000 compare very unfavourably with a quoted series of 7500 deliveries under nembutal and hyoscine anæsthesia at a hospital in St Louis without any maternal death

C W Lull<sup>5</sup> has observed 927 cases He does not regard continuous caudal anæsthesia as a panacea for all patients, and adds to the contra-indications to its use the presence of boils anywhere on the body, profound anæmia, placenta prævia, accidental hæmorrhage, obesity, dwarfs (because of the low-lying dura), and syphilis because of possible lesions of the central nervous system He states that cardiac disease, upper respiratory infections, and premature labour are ideal indications for its use, so also is pre-eclampsia. At the Philadelphia Lying-in Hospital since June, 1943, 510 patients out of 964 were thought to suitable for, and were given, continuous caudal anæsthesia. The failures were 8 per cent He records 2 maternal deaths, but neither was due to metycaine As the result of his experience he states that the correct time to commence the anæsthesia is when the pains come every 5 minutes and last for 30 seconds; the cervix should be 3 cm.-dilated and the presenting part engaged If spinal fluid is obtained after insertion of the needle, the method is abandoned as far as that patient is concerned, if blood is aspirated into the syringe, the position of the needle is altered till no more blood comes A test dose of 8 c c is given (in a later paper he adds ephedrine hydrochloride, 50 mg) and then there is a wait of 10 minutes to rule out an inadvertent intrathecal injection. The blood-pressure fell more than 20 points in 8 per cent of his patients, it is treated by 25 mg, of ephedrine hydrochloride and oxygen inhalations. He uses malleable stainless steel needles and only rarely a ureteric catheter. Metycaine, 1.5 per cent, is the solution recommended, and the level of the anæsthesia is maintained by injecting 20 c c every 40 minutes. When the needle has been finally removed, sulphathiazole ointment and a dressing are applied. He finds the ease with which an unreduced occipito-posterior position can be rotated is increased, but the low forceps rate is also increased. Bringing down extended legs and an internal version are rendered unusually difficult. He advises that the child's mouth should-be brought out of the relaxed perineum early, otherwise it will inhale vaginal mucus owing to its tendency to breathe immediately. No special troubles in the third stage are recorded, but post-partum loss is reduced and the average loss was estimated at only 111 c c.

C W Lull and J C Ullery<sup>8</sup> give details of 108 Cæsarean sections under continuous caudal anæsthesia—in 4 additional cases the needle could not be inserted They give as contra-indications to its use in Cæsarean section—gross deformity of the spine, skin infection, profound anæmia, placenta prævia, a hysterical or nervous patient, obesity, a low dura, and patients with glandular imbalance (because they seem more hable to a serious fall in blood-pressure) technique is (1) Reassurance (2)  $1\frac{1}{2}$  gr of nembutal (3) Previous adequate fluid intake (4) A solution of 15 per cent metycaine in Ringer's solution (5) Insertion of needle (6) Inject 8 c c to check that the position of the needle is correct Ephedrine hydrochloride, 50 mg, is added to this 8 cc, except in the presence of hypertension The fall in blood-pressure reported by others is lessened by this addition (7) A supplementary dose of 40 to 60 cc (according to the size of the patient) is then given slowly The patient is now turned on to her back in a 5° Trendelenburg position (8) If the level of anæsthesia does not rise above the umbilious on both sides, a third dose of 20-40 c c is injected slowly (9) When anæsthesia on both sides is at the level of 8D the operation is commenced This is usually about 30 minutes after the first injection, but one patient required 80 minutes (10) Oxygen is administered as a routine. If the blood-pressure falls much, the legs are raised and a supplementary dose of ephedrine is given (11) Morphine after the operation and a nearly-full diet the same evening The minimum amount of metycaine used was 25 c c, and the maximum 370 c c The uterus retracted well in every case after the extraction of the child The complications are the usual fall in bloodpressure, but this is less when the ephedrine is given with the first injection, occasionally headaches and retention of urine are troublesome. There were no maternal deaths, one child died 8 hours after birth

N Block uses a 3-in No 17 gauge malleable steel needle with a blunt tip to lessen the danger of damage to the dura. He records 150 deliveries without a maternal death. He advises a preliminary injection of saline to see that the rate of drip with a No 17 gauge needle is the correct rate for caudal anæsthesia and not the rate that would occur if the dura had been penetrated

J E Fitzgerald, J M Thomson, and H. O Brown<sup>8</sup> record 200 cases in which pontocaine was used The solution favoured is 1–1000 in normal saline with 1–200,000 suprarenn added In cases of doubt, the location of the needle is identified by the gravity drip test with saline as advocated by N Block and S Rothstein The same pontocaine solution may be used to infiltrate the skin and deeper layers to lessen the pain caused by the introduction of the needle The average time taken from the skin wheal to the first test dose injection was 19 minutes. The results given are 85 per cent completely successful; in 3 cases the caudal canal could not be found, in 10 the anæsthesia was

interrupted by an accident such as the needle coming out, in 9 others an interruption occurred, but was remedied; in 1 case the subarachnoid space was entered. Surgical removal of broken needles was necessary twice. Two patients had severe post-partium hæmorrhage. The blood-pressure dropped markedly 34 times (once from 150/100 to 70/40). One patient had incontinence of fæces for 3 days, and another (syphilitic) woman still had bilateral foot-drop 9 weeks after delivery. Catheterization is necessary and the low forceps rate high

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W F Mengert<sup>10</sup> used the ureteric catheter on 240 obstetric patients. A No 13 3½-in needle was inserted into the caudal canal and a No 5 ureteral catheter threaded through it. Procaine hydrochloride 1.5 per cent in saline was employed. The standard dose was 30 c.c. Prior to the introduction of the needle 1.5 gr of nembutal were given. The operator failed to introduce the needle on 18 occasions, but apparently 9 different men were trying to learn the technique. Good results were obtained in 68 per cent and failure in 16.9 per cent.

Some useful anatomical work has been published since the subject of continuous caudal anæsthesia has become so popular. V S Lanier, H E McKinght, and M Trotter<sup>11</sup> examined 56 cadavers to find the level in the epidural space to which a given amount of fluid will reach—this was found to be variable. They also investigated the distance between the caudal end of the dura and the apex of the sacral hiatus. The average level of the apex of the hiatus was the lower third of the body of the 4th sacral vertebra, but in 38 per cent the level was cephaloid to the mean level. The average level of the termination of the dural sac was the middle of the body of the 2nd sacral vertebra, but in 46 per cent of the bodies the sac extended caudal to the mean. The mean distance between the apex of the sacral hiatus and the inferior end of the dural sac was 47.4 mm, but in 42 per cent of the bodies the distance was less than the mean. In 86 per cent the dura could have been reached by a 3-in. needle, and m 64 per cent by a 2.5-in needle

K Kellog and V Parrett<sup>12</sup> found little or no damage to the neuro-muscular mechanism in dogs after prolonged caudal anæsthesia with 1 5 per cent up to 7 5 per cent solutions of metycaine in normal saline

In May, 1944, R A Hingston<sup>18</sup> by special request contributed an article on "Contra-indications and Cautions in the Use of Continuous Caudal Anæsthesia" to the American Journal of Obstetrics He reports that in successful cases a conscious mother painlessly gives birth to a child that cries at once since it is not narcotized, but it is not a method suitable for all patients and is certainly not suited for delivery in the patient's home—this, at once, excludes 70 per cent of all deliveries in U S A Further, he estimates that even in a well-equipped hospital 40 per cent of parturients will present contra-indications to the method, such as patients with quick labours and those who come into the institution with the second stage advanced, as there would not be time for caudal anæsthesia to take effect, nervous patients and those who fear the use of the spinal needle, obesity, placenta prævia unless used for immediate Cæsarean section, accidental hæmorrhage, and high head

Team work between obstetric and anæsthetic staff is necessary and also special training

He advises that the patient should be "surrounded with safeguards of readily-available oxygen, vasopressors, and sterile lumbar-puncture needles for withdrawing the inadvertent massive spinal injection that might result from carelessness"

The sacrum should be X-rayed to rule out anatomical anomalies

The incidence of failures rises rapidly after 5 hours' use, and so the method should not be commenced early in labour The 30,000 recorded cases include

12 maternal deaths, of which 7 could probably have been avoided and 3 were definitely anæsthetic deaths.

It appears, therefore, that the real position is quite different to that announced so loudly and blatantly in the lay press. The reviewer is struck by the absence of recorded cases of its use in hypertensive patients, where the method would appear to offer great advantages, but no series of selected tox-zemic and hypertensive cases seems to have been collected.

R Cron and J. Kleiger<sup>14</sup> report good results in 5 cases of eclampsia—all the mothers and children surviving

As a summary of a severe critic's attitude to continuous caudal anæsthesia, a commentary by Arthur Baptisti<sup>15</sup> may be quoted. He used repeated injections by re-inserting the needle, and the 600th case collapsed from an accidental intradural injection but recovered. He noted a great increase in 'low' forceps as opposed to 'outlet' forceps. He quotes a fatality occurring to the 100th patient at Johns Hopkins Hospital from an accidental intradural injection. Another death at a third Baltimore hospital seems to have caused caudal anæsthesia to have been abandoned in all three large Baltimore hospitals.

He gives the credit of first introducing continuous caudal anæsthesia to E S Hopp, <sup>16</sup> who published a short series in 1941, although it attracted little attention at the time

He regards the promise of "safe, painless childbirth" as a misrepresentation, although the relief of pain is often dramatic, and points out that Hingston and Edwards admit that the incidence of operative obstetrics is increased and also the incidence of posterior positions and transverse arrests in the mid-pelvis, and finally make the incriminating admission that the "entire course of labour is altered". He suggests that the test of time will put continuous caudal anæsthesia in its appropriate place in obstetrics, and until this comes about we must hope that the minimum number of mothers will suffer harm

A small series of London cases without maternal complications has been recorded by A. Galley and J Peel  $^{17}$ 

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CORNEA, DISEASES OF. (See also EYE INTECTIONS—TREATMENT BY PENI-CILLIN) SIT Stewart Duke-Elder, M D., F R C S.

Mustard-gas Keratitis.-Although gas warfare has not yet figured among the horrors of the present war, a few sporadic cases reported from industrial and training accidents have given rise to clinical problems, more important, however, is the wide recognition of the occurrence of late mustard-gas keratitis appearing to-day from burns sustained during the last war. Since these cases are difficult to treat, and deserve, and can obtain, State aid in their treatment as well as pension rights, the diagnosis is of great importance moreover, the disease is a new one the end-results and prognosis of which are not fully known, and it may have a bearing on other chemical injuries to the cornea in industrial processes. Ida Mann¹ (1944) has lately reviewed 84 cases which were exposed to mustard gas in 1917-18 and which have recently passed through Moorfields Hospital. the numbers suggest that many more cases are occurring without the diagnosis being made, since after the long interval the patients do not associate the delayed keratitis with exposures to gas In the great majority of cases they consider that they have long since completely recovered from this experience, while the condition is treated by the medical practitioner as "recurrent corneal ulcers" The long quiescent period of up to 25 years is most misleading

The diagnosis is made essentially on the history, the presence of scarring on the cornea with fat and cholesterin degeneration, a considerable amount of corneal anæsthesia, varicose conjunctival and corneal vessels, and white avascular scarred areas on the interpalpebral conjunctiva The clinical appearances were described by Phillips<sup>2</sup> (1940) and subsequently confirmed experimentally by Mann and Pullinger<sup>3</sup> (1942-3) In the long quiescent interval usually the only complaint is of altering refraction, this being characterized by the appearance of, and increase in, a horizontal plus cylinder due to slow alteration in curvature of the transverse scar in the cornea Eventually, in a period of from 10 to 20 years, ulceration begins to appear, and the recurring ulcers tend to heal, leaving faceted scars which diminish visual acuity. Treatment by the usual methods has been most unsatisfactory and has been characterized by more frequent and more severe recurrences up to recently, sewing together of the lids has given the most satisfactory results until contact lenses were introduced as a therapeutic agent, an expedient which has proved most valuable in about 50 per cent of the cases

A typical history is as follows

A man, now aged 45, was gassed in 1918 and was severely ill for two months and convalescent from the matter that He apparently recovered and returned to his trade of wood turning, which he followed without trouble until 1928. He then sustained a slight injury to the right eye, which produced an ulcer. This history of the first onset of ulceration of the unstable scar following a minor injury is common. In some instances it is misleading, as the sensation of a beginning ulcer is very like that of a small foreign body. In this instance it is probably true, since no further trouble occurred in this eye for six years. After the ulcer had healed in 1928 the patient's visual acuity was reduced to 6/12, as a small faceted scar was left. The visual acuity in the left eye was 6/6. This had dropped to 6/9 in 1932 without ulceration, but subsequently improved again slightly to 6/6 m 1934. The right eye began to give serious trouble in 1934, when acuity was reduced by recurrent ulceration to 3/60. This improved to 6/18 the following year, but relapses occurred in 1937, and it fell to 3/60 again. A contact lens was fitted in November, 1937, which improved the vision to 6/12. Ulceration recurred once in 1938, reducing the sight to 6/60 with the contact lens, but this has now improved to 6/18 and no further breakdown has occurred. The left eye had an attack in 1937 and was reduced to 6/9, improved to 6/6 with a contact lens. A severe breakdown occurred in 1939 and vision was temporarily down to 4/60. This eye has also remained well, and with a contact lens is 6/6 again. The man wears his contact lenses the whole day and is now comfortable. The cornex show typical scars and are insensitive. This is almost always the case and, in part, explains the usual excellent tolerance for contact lenses.

This history, with its long interval, its repeated attacks, and its fluctuating but slowly deteriorating visual acuity, relieved by wearing contact lenses, is typical of roughly 46 per cent of the cases What their subsequent fate will be we do not yet know That wearing contact lenses does not entirely prevent breakdown and further deterioration of sight seems certain, but it is equally certain that in a number of cases retention of visual acuity and continuance in work has been made possible for many years (up to seven years, at present) What we do not know is whether earlier fitting would have prevented or retarded breakdown

Of the 84 cases studied, in 39 instances the lenses are worn with comfort during the working day Of these 39, 17 wear them the whole of their waking life, 10 wear them from 10 to 12 hours a day, and the rest for periods varying All of these are doing fairly intelligent work. Eleven cases from 8 to 10 hours wear their lenses for 5-8 hours per day, 8 are unable to wear them for periods of 5 hours, 5 could not wear them at all, and 21 cases have disappeared from Although relapses do occur in contact lens wearers, they tend to be less frequent, since the glass protects the insensitive cornea from small injuries, and any relapses which do occur are due to the continuance of the deep pathological changes in the cornea rather than to surface irritation. Of the 84 cases, 25 had no relapses at all after fitting, 49 had relapses (of these 4 had one only, and 16 slight only, while 19 were of moderate severity and 10 were severe) The history of 10 is uncertain, but they have made no complaint

If severe relapses occur, visual acuity, even with contact lenses, falls in the course of years We do not know the end-result, but descemetoceles may occur (this does not preclude the wearing of a contact lens), and in very rare cases perforation There is one small descemetocele (with visual acuity 6/24), but no perforation, in this series

In the course of fitting some of these patients, and afterwards, relapses occurred, and various other treatments had to be resorted to The commonest lesions observed were —

- 1 Small shallow ulcers These heal fairly quickly with mild mydriatics and heat. Hyoscine and diathermy were usually given as a routine, but some of the patients stated that they healed practically as well with hot bathing at home and no drops
- 2 Deeper ulcers, discharging cholesterin and fatty debris from the base These take longer to heal and may require tarsorrhaphy They are sometimes hastened by gentle curetting
- 3 Superficial plaques, raised from the surface, of degenerative material These may mechanically interfere with the wearing of a contact lens and should be scraped off They are usually easily removed, and much relief is experienced by the patient
- 4 Varicose vessels and blood islands. Sometimes the abnormal vessels at the limbus and just on the cornea become very dilated. The circulation may cease and the distended ends of the vessels may remain like small red blisters. These should be pricked and the blood coaxed out of them. If it is still circulating the feeding vessels should be divided with a fine cautery or a peritomy performed. The relief obtained lasts a long time, though there is a tendency for slow reappearance in adjacent zones.

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# CORONARY SCLEROSIS (Anguna Pectoris; Coronary Thrombosis) (See also article Anguna Pectoris) A Tudor Edwards, M Ch, F R C S

In previous numbers of the Medical Annual, reference has been made from time to time to the experimental results of attempts at increasing vascularization of the myocardium in which the coronary blood-supply is deficient. Such experiments were largely initiated by Claude Beck, of Cleveland, Ohio, and were later continued by O'Shaughnessy in England and by Rienhoff in America

These experiments primarily consisted in the application of pedicled grafts of pectoral muscles to the roughened epicardium, or of omentum drawn through the diaphragm into the chest. Each of these procedures had obvious disadvantages, the former because of the relative seventy of the operation, the latter because it was followed in some instances by the development of a diaphragmatic hernia Beck¹ continues to experiment, by which means alone he is convinced that the problem can be solved, but as a result of the experiments already performed at least one new concept has been formed concerning the nature of coronary disease. He compares it to epilepsy, in that a zone of hyper-irritability occurs from the anoxemia secondary to coronary sclerosis. This zone he terms the "trigger", which can "fire" and destroy the normal cardiac physiology. Such a focus in the brain produces a convulsion, in the heart, it destroys the coordinated rhythmic contraction and relaxation of muscle fibres, and produces ventricular fibrillation, some fibres contracting, others relaxing. The patient dies because the heart cannot expel blood

Another concept is what he terms a blood-bath to the "trigger" zone, by which he means an amount of oxygenated blood which will (1) reduce the

irritability of the zone and prevent it from "firing", and (2) preserve the viability of heart muscle and prevent it from degenerating into scar tissue.

Experimentally a trigger can be produced by ligation of a number of small arteries leading to a zone of myocardium. One small artery after another is ligated and the myocardium becomes increasingly cyanotic. For example, perhaps after ligation of five of these small arteries no effect is produced—the ligation of the sixth channel results in death of the animal, this additional channel may be regarded as "the last straw". Thus, according to Beck, a small amount of blood can be effective as a blood-bath—can make the difference between recovery and death.

Two methods may be employed to increase the blood-supply or produce a blood-bath (1) The establishment of extra-coronary communications by grafting tissue upon the heart, (2) The establishment of intercoronary communications by producing inflammation on the surface of the heart by operative methods

- 1 The tissues available are numerous, but only two have had any more than experimental trial, namely, pectoral muscle and omentum
- 2 The coronary arteries are essentially end-arteries, which accounts for the development of an infarct when a major vessel is occluded, but inter-coronary communications can be produced by inducing inflammation on the surface of the heart. Abrading or scraping off the epicardium by special burs produced efficient inter-coronary anastomoses. This was proved by ligation of the left coronary artery in 100 dogs, half of which had previously had the abrasion operation. The mortality in the abraded group, which were necessarily submitted to two operations, was 38 per cent, and in the control group 70 per cent.

Abrasion of the human heart produces tachycardia and extrasystoles and is therefore undesirable, but a similar end-result may be attained by the application of inflammatory agents to the heart surface

P Schildt, E Stanton, and C S Beck² tested the effect of various substances as to their immediate and remote effects in producing vascular adhesions Many substances produced intense inflammation with rapid death—such substances were croton oil, santal oil, formaldehyde, etc., others caused death by formation of an effusion—such were sodium silicate, agar, etc., others produced early adhesions which were absorbed later—e.g., sodium morrhuate and sodium ricinoleate

The most satisfactory substance was found to be silicate in the form of powdered asbestos, as the inflammatory process is well vascularized when it is used in small quantities such as 0.2 g. It produces a small exudate, but the scar tissue formed does not cause cardiac compression. In animals the beneficial effects were indicated by ligation of the descending ramus of the left coronary artery at its origin. Mortality in 50 normal animals following ligation was 68 per cent. Mortality in animals in which asbestos had been applied to the surface of the heart previous to ligation was 32 per cent.

In addition, the size of the infarcts in the latter group was smaller than in the control group, in some no infarcts could be found. Further, intercoronary communications were better developed in the specimens in which asbestos had been used compared with those found in normal hearts.

It is interesting that the various silicates produced different types of reaction Talc or magnesium silicate failed to produce the beneficial adhesions stated by some operators, kaolin, a hydrated silicate, was absorbed and found in the lymph-glands, producing no reaction, whereas asbestos consisting of fibrous magnesium and calcium silicates produced the maximum of beneficial effects in small dosages of about  $0.1-0.2~\mathrm{g}$ 

REFERENCES -1Ann Surg 1943, 118, 788, \*Ibid 24

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CUSHING'S SYNDROME. (See PITUITARY GLAND)

DIABETES INSIPIDUS. (See PITUITARY GLAND)

## DIABETES MELLITUS. Wilfrid Oakley, MA, MD, FRCP.

Alloxan Diabetes.—The results of J Shaw Dunn and his co-workers on alloxan diabetes have been confirmed both in the rat and the rabbit F G Young and L L Ware found changes in the rat's beta cells within five minutes of the injection of alloxan in a dose of 300 mg per kilo, but no evidence of the initial hyperplastic reaction to the drug or of stimulation of the insulin-secreting mechanism postulated by Shaw Dunn Three rabbits with persistent alloxan diabetes were found to resemble in behaviour the depanceratized animal These workers further showed that the hypoglycæmic response to alloxan in the rabbit is similar to that produced by 10 units of protamine zinc insulin (P Z I) both in the fasting state and when the animal is allowed to take food As the pancreas of a 1-kg normal rabbit contains about 10 units of extractable insulin, it is reasonable to suppose that the hypoglycæmic phase is due to the slow liberation of insulin from dying islet cells, and is not hepatic in origin

A B. Corkill, P Fantl, and J F Nelson<sup>3</sup> found that alloxan per se has no action on the blood-glucose level and concluded that the hypoglycæmia is due to liberation of insulin

The mechanism of the diabetogenic action of alloxan has been investigated by M G Goldner and G Gomori, who found in rabbits that, while insulin will counteract the initial alloxan hyperglycemia, it does not protect the islet cells against the injurious effect of alloxan or stop the development of alloxan diabetes. This is in contrast with the mechanism of pituitary diabetes in which the hyperglycemia produced by anterior pituitary extract is necessary for the establishment of diabetes, the maintenance of a normal blood-sugar level by whatever means (insulin, phlorhidzin, or fasting) preventing the exhaustion of the islet cells and the production of diabetes. With alloxan the process takes its course regardless of initial hyperglycemia, and the diabetes may therefore be reasonably assumed to result from direct damage to the beta cells by the drug itself.

The occurrence of cataracts in five rabbits made diabetic with alloxan was reported by C C Bailey, O T Bailey, and R S Leech 5 Opacities began to develop in from four to six weeks after the induction of diabetes and were subcapsular in position, being more advanced in the posterior cortex. was no definite arrangement of the opacities, but a rosette in the posterior cortex was observed in some animals, marked vacuolation and irregular water clefts being seen with the ophthalmoscope These workers were able to produce diabetes in rabbits by repeated injections of alloxan in doses of 40 mg. per kilo, but failed with half this amount even though the total amount of the drug injected was very large, this suggests a cumulative effect of alloxan in the larger dose By this method it was possible to produce transient diabetes which disappeared completely in one rabbit, and in another permanent diabetes which became much milder when injections were stopped Histological studies in two rabbits immediately after the production of diabetes by repeated injections showed hydropic degeneration in some islet cells, while irreversible changes were present in others, and a few were in process of mitotic division The hydropic degeneration found immediately after the development of diabetes suggests that the injury in these particular cells is reversible rather than permanent, such changes have been reported in early cases of human diabetes. Typical diabetic coma with ketonuria, air-hunger, and drowsiness leading to unconsciousness and death in a rat was reported by the same authors following the production of diabetes by the subcutaneous injection of alloxan

in a dose of 200 mg per kilo, this indicates that in rats diabetes induced by alloxan is more severe than that resulting from pancreatectomy.

The therapeutic use of alloxan in a case of islet-cell carcinoma with extensive metastases in the liver and peritoneum, has been described by A Brunschwig, J G Allan, F. M Owens, and T F Thornton 6 The case gave a typical history, and at operation in 1939 two tumours were found in the body and tail of the pancreas, the diagnosis of islet-cell carcinoma being established by biopsy and pathological examination A large tumour was removed in 1940, but attacks began again in 1942, when laparotomy disclosed numerous metastases. Deep X-ray therapy resulted in freedom from attacks for three months, after which they recurred Alloxan was given intravenously in 500 cc of isotonic sodium chloride solution in a dose of 220 mg per kilo, and although the bloodsugar level was not affected, the hypoglycæmic reactions were reduced in number and severity One month later injections were repeated, and during a period of 24 days the patient received a total of 278 g of alloxan, or approximately 25 g per kilo Blood-sugars were definitely higher, but still between 85 and 50 mg per cent, and clinical improvement allowed a reduction in the number of feeds In spite of the further injections of large doses of alloxan, hypoglycæmia recurred with increasing frequency and death followed a final operation, the patient having refused all other forms of treatment there was no evidence of necrosis of islet cells comparable with that seen in the dog or rabbit after alloxan Severe reactions occurred during the period of treatment and were attributed to the alloxan These included nausea, vomiting, and coma, which was relieved by intravenous glucose There was transient jaundice on two occasions and severe anæmia necessitated repeated large blood transfusions A few casts, red blood-cells, and small amounts of albumin were passed in the urine after some injections Control observations were carried out on patients with carcinomatosis of other types In two out of four cases slight transient elevation of the blood-sugar was observed after the injection of alloxan in doses of between 300 and 400 mg per kilo. A fifth patient received a dose of 600 mg per kilo, had a rigor, became cyanosed, and died six hours after the injection Microscopical examination of the pancreas showed questionable evidence of injury to a number of cells in some of the islets, although many islets were not affected. The period of survival after injection was undoubtedly too brief to permit of the development of more extensive changes

Control of Very Severe Diabetes .- The different ways of treating very severe diabetes have been described by R D Lawrence and W G Oakley' with special reference to a new arrangement of insulins for which they claim certain advantages both in theory and practice The use of a mixed dose of soluble insulin (SI) and protamine zinc insulin (PZI) in many severe cases fails completely to control the diabetes, hyperglycæmia being persistently present, with heavy glycosuria and ketosis in the morning and possibly also at night. The PZI seems only to detract from the action of the SI without exerting much effective action of its own The addition of a dose of SI before tea or the evening meal may prevent heavy nocturnal glycosuria and frequency, but often fails to prevent a relapse by the morning, after which hyperglycemia again tends to persist throughout the day Morning and evening injections of SI still remains a most satisfactory arrangement in many severe diabetics, but in highly sensitive insulin cases this method may fail because it produces a swinging blood-sugar, and, unless large buffer meals are given, severe hypoglycæmic reactions alternating with periods of intense hyperglycæmia and ketosis This tendency is particularly dangerous at night, when hypoglycæmia can only be avoided at the cost of a very high fasting blood-sugar, often accompanied by heavy morning ketosis In order to overcome these difficulties the authors treated Diabetes Mellitus 88 MEDICAL ANNUAL

a series of very severe diabetics with SI in the morning and a mixed dose of SI, and PZI in the evening The advantage of this arrangement is that SI alone in the morning gives a strong rapid insulin action during the early part of the day when it is chiefly needed, whereas when given with PZI, owing to precipitation of some of the SI by the excess of protamine, a larger dose is required to produce the same prompt effect This, together with the ineffectiveness of P.ZI in severe cases, accounts for the fact that enormous mixed doses may be given in the morning with no greater benefit than may result from a comparatively small dose of SI given alone The truth of this observation has been confirmed by the authors in a number of very severe diabetics by suddenly withholding from the morning mixed dose all the PZI, amounting to 30 or 40 units or more, the only apparent result being a lowering of the noon blood-sugar Such cases are exceptional, but their existence should be remembered when very large doses of PZI appear to be having little or no The mixed dose of SI and PZI was given at night on the assumption, confirmed by experience, that it would prevent a high fasting blood-sugar and morning ketosis, and also exert some hypoglycæmic action on the following day, especially before meals In order to avoid the possible danger of nocturnal hypoglycæmia, the dose of PZI was always kept lower than that of SI and the patient given an adequate bedtime feed. The results obtained by this method of treatment in some 100 cases confirmed the theoretical advantages, and showed not only an improvement in diabetic control, but also a reduction in the daily insulin requirement Particularly good results were observed in pregnant diabetics and in some children

Globin Insulin.—Clinical experience with this new insulin preparation has increased greatly since it became available for general use, with the result that it is now becoming possible to form a better opinion on its value in the treatment of diabetes H O Mosenthal's has reported his findings in a series of some 50 cases, nearly all ambulant, treated with globin insulin (GI) from which he concluded that this insulin is a distinct addition to the existing therapeutic means for the more accurate and efficient management of diabetes. He found that in man GI produces a fall in blood-sugar within 2 hours of injection, its action being in this respect intermediate between that of soluble insulin (SI) and protamine zinc insulin (PZI) While admitting that no hard and fast rule can be formulated on the duration of the effect of insulin on the blood-sugar, and that only what might be termed "limits of error" might be proposed, Mosenthal considers that available evidence supports the conclusion that as a rule G I acts for 12 to 16 hours and occasionally up to 24 In mild diabetics in whom the blood-sugar is raised only after meals and not in the fasting state, the action of PZI and GI in doses of about 20 units is almost identical, the chief difference in their use in treatment being in the arrangement of the patient's diet GI tends to produce hypoglycæmia in the late afternoon, and diabetics on it should therefore be given a considerable luncheon or extra food at about 3 30 to 4 p m, while PZI, by virtue of its more prolonged action, calls for a feed at bedtime The material studied was subdivided into mild cases requiring 30 units or less of insulin, severe cases requiring more than 30 units of insulin, given GI only, and severe cases requiring dual injections, one of PZI and one of GI The first group consisted of 14 patients, in 4 of which PZI proved unsatisfactory, of those, 2 gave allergic reactions to PZI but not to GI, 1 had morning headaches which disappeared when GI was substituted for PZ.I, and the fourth gave satisfactory control with GI after PZI alone and when mixed with SI had been tried without success. It is assumed that the remaining 10 patients would have done equally well on GI or PZI The conclusion reached is that in

mild diabetes PZI and GI are equally effective, but that there are a few cases in which, because of certain idiosyncrasies, GI is preferable to PZI, the converse being probably true in some instances

In the second group the results are unconvincing, and, although 10 cases were treated satisfactorily with single large doses of GI, in 3 only were the results compared with those obtained with PZI, SI, or a mixture of these insulins, no blood-sugars being recorded

For severe diabetics requiring dual injections the author prefers the method of adjusting the proportions of the two insulins to meet the needs of each case to the use of any standard mixture of S I and P Z I, and claims that the degree of control obtained by the latter can be equalled, if not excelled, by separate injections of G I and P Z I given one hour before breakfast. The results published in support of this view are again unconvincing, as they appear to be based on night and morning urine tests and fasting blood-sugars which give no indication of the degree of control of post-prandial hyperglycæmia. The use of G I instead of S I for combination with P Z I would seem to be illogical in view of the author's earlier admission that the hypoglycæmic action of G I is weaker and more delayed than that of S I. In conclusion, the author admits that P Z I alone or in combination with S I admirably fulfils all the purposes served by G I, but considers it reassuring to have a second string to our bow

The action of GI has been compared with that of PZI alone and in combination with SI in a series of clinical trials reported by J C Eaton 9 Investigations were carried out on 10 in-patients and 31 out-patients, the cases being selected for treatment with GI because other types of insulin had proved unsatisfactory in some respect. In the first group, after a minimum of 24 hours on their former diet and insulin, a test period was begun, in which without alteration in diet insulin was given at 8 am and the blood-sugar estimated 2-hourly by day and 4-hourly by night for 24 hours The type but not the dosage of insulin was then changed and the investigation repeated Mean blood-sugar curves were then plotted and comparison made between the curves obtained with single doses of GI and PZI, with GI alone and a mixed dose of PZI and SI, and PZI alone and mixed with SI The first comparison showed a lower fasting value with PZI than GI, but with the latter the curve reached a lower level at 4 pm, between these times the general form of the curves was similar Comparing G I and a mixed dose of P Z I. and SI, the latter was found to give consistently better control, while the third comparison, as would be expected, favoured the mixed injection, the curve with PZI alone showing a sustained elevation between the hours of noon and 10 p m As the author points out, better control of the blood-sugar might have been obtained by varying the diet, and it is therefore impossible to draw conclusions from these results as to the relative therapeutic values of the methods of treatment investigated

In the second group 21 of the 32 patients responded favourably to GI, of the 8 who failed to respond to PZI alone or PZI with SI, 4 were reasonably well controlled on GI, and required, on the average, a slightly smaller dose than that which had previously failed to effect control. Hypoglycæmia with GI was at first fairly frequent and attributed to lack of experience in its use, increase in carbohydrate intake by day largely overcame this complication. The most suitable distribution of carbohydrate for patients on GI was found to be 8 am, 25 per cent, 11 am, 10 per cent, 12 30 pm, 30 per cent, 4 pm, 10 per cent, 7 pm, 25 per cent. Hypoglycæmia with GI almost always occurred between 11 am and noon or between 4 pm and 6 p.m, and never at night if the injection was given before breakfast. Local reactions were less troublesome with GI than with PZI, and success or failure with the

former was not apparently related to dosage (up to 60 units), sex, or age of patient, or to total daily carbohydrate intake

Eaton concludes that G I. gives results more nearly physiological than any other single type of insulin, and its action closely resembles that of mixed doses of P Z I and S I containing over 50 per cent of the latter. The freedom from local reactions with G I is stressed, and the absence of insulin atrophy noted, although the number of cases treated was admittedly too small and the duration of treatment too short to warrant a conclusion on this latter point

In this article a further point of some interest and importance is raised which may have a direct bearing on the usefulness of G I British regulations for the preparation of P Z I lay down that the free insulin in P Z I must not exceed a certain amount. In the past the quantity of excess protamine has varied considerably in different brands, and in theory this variation would be expected to cause corresponding variations in the response to mixtures of P Z I and S.I, the number of units of S I combined depending on the amount of excess protamine present. In his investigations Eaton observed no such variations, but the irregularity of the response to mixtures of P Z I and S I observed in many diabetics carefully studied over long periods may well be due in part at any rate to this factor, this point should be clarified if and when the composition of P Z I is standardized, as there is reason to hope it soon will be.

Little is yet known and nothing published on the effects of mixing G I and S I, although such a mixture has already been used successfully by a number of clinicians, including the reviewer. Mosenthal states that mixtures of G I and S I., although not thus far attempted, would serve no apparent purpose, a view unsupported by his own conclusions on the similarity in action between small doses of G I and P Z I and by our limited experience of such mixtures If it is found that S I can be mixed with G I without any impairment of the former's rapid and strong hypoglycæmic action, or if G.I can be so prepared as to allow of this, we shall have a valuable addition to our methods of treating severe diabetics with a single injection

The argument that G I by itself is able to control the post-prandial hyperglycemia in severe diabetics, and therefore does not require the addition of S.I, is quite unsupported by the observations of R D Lawrence of or the reviewer, who have found that the noon blood-sugar in many diabetics is no lower, and in fact sometimes even higher, on G I. than on the same dose of P Z I

Diabetes and Glycosuria in Selectees and Volunteers.—H. Blotner and R. W Hyde11 have recorded their studies in diabetes and transient glycosuria in 45,650 consecutive selectees and volunteers between the ages of 18 and 45, who appeared for final examination at the Boston Armed Forces Induction Station. Glycosuma was found in 367 cases, or 08 per cent of the men examined diagnosis of diabetes was made in 208 cases, transient glycosuria in 126 cases, and renal glycosuria in the remaining 33. The diabetes in 107 was mild, in 58 moderately severe, and in 48 severe. The incidence of mild hypertension was higher in men with diabetes and transient glycosuria than in a control group, but pulmonary tuberculosis, as determined by radiography of the chest, occurred with essentially the same frequency in volunteers with glycosuria as in those without it A family history of diabetes was obtained in 82 per cent of the diabetics and in 9 per cent of cases with transient glycosuria, as compared with 5 2 per cent of 2293 consecutive non-diabetic selectees prevalence of diabetes was not related to the social or economic level of the volunteers, but was lower in the American group than in the non-American group, as compared with the incidence of the nationalities in the control group. The incidence of diabetes in the Jews and the Irish was outstanding

This article is one of several recently published in America on this subject, and, when all the relevant data have been collected and analysed, the results should provide valuable new information on the incidence of diabetes and glycosuria In addition, if the cases of so-called transient glycosuria can be followed up, the significance of this condition will be greatly clarified. It will be noted that the number of cases so diagnosed is remarkably high, 126 out of 367, and yet this diagnosis receives little recognition in this country. The reason for this is that in America renal glycosuria is diagnosed only when the renal threshold, by our standards, is very low-100 mg per cent or less. The diagnosis of renal glycosuma, therefore, tends to be confined to those cases which show persistent glycosuria, the term transient glycosuria being applied to that much larger group of cases whose threshold is below the accepted normal value of 170 to 190 mg per cent, but not so low as to give rise to glycosuma in the fasting state Such cases would be included in this country under the diagnosis of renal glycosuria, although the majority of them only pass sugar in their urine after meals

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#### DICOUMARIN.

Stanley Davidson, M.D., FRC.P. H W Fullerton, MD, MRC.P.

This substance, which lessens the coagulability of the blood by reducing the prothrombin level, has been referred to in previous editions of the Medical Annual. The present position may be summarized as follows. The drug is effective when given by mouth, and the degree of hypoprothrombinæmia produced can be varied by adjusting the dose. Unfortunately there is considerable variation in the response to a given dose, so that daily estimations of the plasma prothrombin are necessary, not only to guard against the production of a dangerous hæmorrhagic state, but also to ensure that an adequate decrease in coagulability is achieved. These considerations make it undesirable that the drug should be used in circumstances where such a careful control of the dosage is impossible.

So far the drug has been used mainly in established thrombophlebits and in the prophylaxis of venous thrombosis after operations which commonly precede this complication. Favourable reports on its use in such cases were reviewed in last year's Medical Annual. H. D. Zucker¹ has added to these He was impressed by the beneficial effects of treatment with discountarin in a series of 18 cases, and noted that in thrombophlebits the pain disappeared when the prothrombin level was lowered, an association which has not been noted previously

Hitherto it has been agreed that if the prothrombin level is dangerously reduced by discoumarin and a hæmorrhagic state results, the proper treatment is to withdraw the drug and give transfusions of blood to restore the prothrombin level as rapidly as possible. Vitamin K in the usual doses has been regarded as useless in the treatment of this emergency 3,3,4,6. However, C S Davidson and H MacDonald have shown recently that very large doses of vitamin K<sub>1</sub> oxide (180 to 250 mg) given intravenously in about a litre of fluid can prevent the hypoprothrombinæmia which would be produced by a single large dose of discoumarin, and can restore the prothrombin level to normal within 24 hours if it has already been lowered by this drug. It is doubtful if this method has any advantages over blood transfusion, which appears to act at least as rapidly. For example, A Cahan has reported the case of a patient, who, as a result of receiving 2800 mg. of discoumarin in 32 days, developed

severe hæmorrhagic manifestations. Twelve hours after the transfusion of 250 c c of citrated banked blood plasma, bleeding from the gums ceased and no new purpuric patches appeared. Additional transfusions were given subsequently

REFERENCES — J Amer med Ass 1944, 124, 217, \*Ibid 1942, 120, 1009, \*Amer J med Sci 1942, 204, 11, \*Canad med Ass J 1942, 46, 214, \*J .imer med Ass 1942 120, 1015, \*New Engl J Med 1943, 229, 353, \*Ibid 223, 820

### DIPHTHERIA.

Thomas Anderson, MD, FRCPEd.

Epidemiology.—Diphtheria notifications continue to fall in number, for 1948, the total of 34,662 notifications in England and Wales represents a drop of 6700 on that for the previous year 1 On the other hand, it needs to be stressed that 1370 persons died from the disease during the year That immunization is beginning ventable disease this is not good enough really to affect the figures is shown by a joint paper from Medical Officers of the Ministry of Health<sup>2</sup> who have made a careful statistical study of the incidence of diphtheria in immunized and non-immunized children under 15 years of age At the end of 1943 about half the child population could be assumed to have undergone a course of protective inoculations During 1943 the estimated rate of dying from diphtheria was 25 times as great among the non-immunized as among the immunized. In 1942 the death-rates in the 2-15 years agegroup fell below the lowest rates recorded between 1931 and 1941. Finally, a comparison of each half of 1943 with the corresponding half of 1942 showed that while the deaths in the age-groups between 1 and 15 years have been reduced by 14-50 per cent, they have risen under the age of 1 year and over 15 years In other words, the reduction of deaths is occurring in those age-groups where immunization is most completely practised Provisional returns for 1944 show that in the first half of the year deaths numbered 500 as compared with 811 in the first half of 1943, and 989 in the first half of 1942

Active Immunization.—In last year's Medical Annual this subject was very fully reviewed, and the problems which it raises were discussed Despite our increasing knowledge of the benefits that follow widespread application of immunization measures, it is unfortunately true that Britain still falls below the standard required to produce a dramatic fall in incidence. Although the statistics given above show that the immunization campaign is beginning to bear fruit, they also indicate that much remains to be done N L. Murray<sup>8</sup> points out for South Africa what is equally true for Great Britain, that a high proportion of the cases occur before the fifth year From a community point of view, therefore, immunization carried out after the age of 5 does not pay the same dividend as immunization between 9 and 12 months. This lesson still needs to be pressed home, even in a well-immunized community there must be an annual increment of new immunizations roughly equivalent to the number of births if the community is to remain well immunized J A Scott<sup>4</sup>, the Medical Officer of Health for one of the London boroughs, has shown that for his district the risk of an immunized child catching diphtheria is twelve times less than that of a non-immunized child, while the risk of an immunized child dying are a hundred times less These figures are paralleled in every campaign, but for improvement in the statistics of the country renewed effort will constantly be required. Those engaged in inoculation work are now unanimous that a single refresher dose 3-5 years after the primary course is essential if immunity is to be kept up to an effective level H L Duke and W B Stott, for example, examined by Schick test 3000 children from two to six years after successful immunization. As time lengthened an increasing proportion relapsed to the positive state—after two years only 4 per cent, but after six years 18 per cent, had become Schick positive.

The progressive decrease with age of primary Schick-positive reactors is discussed by A Anderson, who records the results of tests on 16,774 children attending clinics in London (99 per cent were positive at 1 year, falling to 68 per cent by the age of 13 years). He concludes that this expresses an increasing experience of the specific toxin, and such a conclusion is supported by Duke and Stott (above) who found no evidence of a natural immunizing process in the 'under fives' in their rural area. On the other hand, certain African experience would suggest that other factors, e.g., race, may play an important part. J. F. Murray' has found that although diphtheria among the Bantu is uncommon, the native children (between 6 and 17 years) showed a high Schick-negative rate (from 86 to 92 per cent). This unusual finding does suggest that the native races may differ from the European in their capacity to produce antitoxin readily.

Bacteriological Aspects.—J W McLeods has reviewed extensively our present knowledge of the three types of diphtheria bacilli-mitis, intermedius, and There can be little doubt that the three types are distinct bacterial races, that there are many atypical strains is not denied, but the bulk of evidence suggests that such strains are of little epidemiological importance classification has two main practical advantages First, clinically fatality-rates of the large series of about 25,000 cases which he has collected aregravis 8 1 per cent, intermedius 7 2 per cent, and mitis 2 6 per cent. Paralytic complications are most common in gravis cases, larvngeal diphtheria more common in mitis infections Second, epidemiologically Ordinary endemic diphtheria is usually a mitis infection, when gravis and intermedius appear it is usually as an epidemic (perhaps running alongside the endemic disease) Knowledge of type incidence, therefore, may allow a forecast of epidemic spread Further, it would seem that carriers of gravis and intermedius strains are less common than carriers of mitis and atypical strains Finally, the finding of a gravis strain almost always implies a virulent organism, whereas with mitis or atypical strains a virulence test is essential, for many are non-virulent

R Cruickshank<sup>9</sup> and H A Wright<sup>10</sup> both discuss the importance of a complete laboratory diagnosis, and underline some of the points brought out in the preceding paragraph. Knowledge of the type of infection clearly affects prognosis, and Cruickshank suggests that the gravis and intermedius cases must demand as a rule more careful nursing. The value of the tellurite medium in picking up carriers is also stressed, Cruickshank quoting the case of a nurse who contracted a fatal infection due to the gravis bacillus. The contacts in the ward were swabbed, but only throat swabs were taken. Repeat swabs of both throat and nose revealed two children who were heavy carriers, the one of the gravis, the other of the mitis type. The infection of the nurse was clearly from the gravis carrier. In another outbreak the contacts were all swabbed and the carriers removed to an infectious disease hospital. Shortly afterwards another case occurred which suggested that a carrier had been missed. However, the first outbreak was a gravis infection, whereas the second was mitis, thus showing that the two epidemics were unrelated.

Cutaneous Diphtheria.—H C M Williams<sup>11</sup> records 19 military patients who had lesions of the skin or eyes from which C diphtheriæ were isolated (four of the organisms were non-virulent and three were not tested). These cases occurred during a time when the military hospital sent 18 other cases of faucial or nasal diphtheria. Eight of the organisms isolated were of gravis type. Despite this the toxæmia was light no paralysis ensued. The average time in the military hospital before transfer (i.e., before diagnosis) was 4½ weeks. Clearly the military physician should be on the outlook for these bizarre manifestations of diphtheria in conditions such as impetigo which fail to clear up rapidly.

- T A McGibbon<sup>12</sup> underlines this conclusion when he relates his experience of 71 cases of diphtheria in a military hospital in the Middle East 49 were faucial or pharyngeal, 2 laryngeal, 8 nasal, and 12 non-respiratory. The difficulty in establishing correct diagnosis under field conditions is emphasized, in quite a few the diagnosis was made late, sometimes on the appearance of the typical polyneuritis The ages of the patients were about 25 or 26 years. and the complicated case-rate was high-42 per cent Peripheral neuritis was noted in 19 (27 per cent), usually occurring in the third to seventh week The third and tenth cranial nerves were affected most frequently, no matter what the initial involvement—faucial, nasal, or cutaneous—the distribution of paralysis was much the same Loss of sensation was variable, but in the cutaneous cases seemed to be most marked around the initial lesion quent wasting and ataxia were common Myocardial involvement was noted in 17 (24 per cent), and both types, early and late, were seen. Three of the deaths were due to this cause Such complications accounted for considerable delay in dismissal, the average stay in hospital for such cases being 131 days He discusses the high complication rate and attributes it to three causes -
- 1 Missed Cases —This was particularly liable to happen in cutaneous cases, and he advises that all burns, indolent and chronic ulcers, etc., should be swabbed for C diphtherice
- 2. Treatment—Only two of the cases were given intravenous antitoxin. Further, under military conditions it was difficult to be sure that diphtheria was as rigorously nursed as at home. It may be well-nigh impossible to ensure that the patients lie flat, do not get out of bed, or do not wash and feed themselves
- 3. Type of Organism —Not unnaturally under the conditions ruling 'typing' could not be done It is thought very probable that most of the cases were gravis infections

REFERENCES — Rep Min Hith 1944, \*Bull E P II L S. 1944, 3, 142, \*S Afr med J 1943, 17, 334, \*Publ Hith 1943, 57, 2, \*Brit med J 1943, 2, 710, \*Med Offr 1943, 70, 187 and 165, \*J Hyg, Camb 1943, 43, 170, \*Bact Rev 1943, 7, 1 \*Publ Hith 1943, 57, 2, \*Bedinb med J 1943, 50, 737, \*Brit med J 1943, 2, 410, \*Bedinb med J 1943, 50, 617

### DIPHTHERIA: EPIDEMIOLOGY AND PREVENTION.

Ralph M F Picken, M.B, Ch B., B Sc, D P H.

Changes in Type of C. diphtheriæ -H S Carter has reported on the types of C diphtherize from more than 11,000 cases submitted for examination in Glasgow during the years 1934 to 1942 At the beginning of this period gravis types amounted to only 5 per cent, intermedius 61 per cent, and mits 81 per cent, by the end, the corresponding percentages were 68, 19, and 13. The decline in mits types was rather sudden in 1935 and gradual thereafter. Intermedius began to fall proportionately in 1937, and gravis rose suddenly in 1938 and has increased steadily since then During most of the period the incidencerate of diphtheria was rather high, but it was especially heavy in 1940-41 The mean case mortality rate has been fairly low, about 48 per cent for all types of infection. During recent years, when graves strains have prevailed, the case mortality rates for the three types have been gravis 486, intermedius 3 86, and mits 1 40 All types have declined in lethal power, and gravis has not been specially potent in this respect When the rates are calculated in age-groups in recent years, the case mortality for gravis under 5 years has been 8 3 per cent and 5-15 years 46; corresponding rates for intermedius were 1 3 and 3 4, and for mits 5 4 and nil The striking feature of the gravis strain in Glasgow has been its communicability rather than its lethality deaths from gravis infections at ages 5-15 occurred in immunized children, giving a rate of 15 per cent One fatal case in an immunized child under 5 years of age was caused by the *mitis* type Carter also shows that in Glasgow, as elsewhere, there has been a gradual shift of fatality over a long period to higher ages and also latterly of incidence, but the effect of the immunization campaign could not yet be assessed

Immunization in Scotland.—A Russell<sup>2</sup> reports that up to 1941 about 122,000 children had been immunized throughout the whole of Scotland, but as the result of a vigorous campaign begun then a further 800,000 are estimated to have been immunized up to the first half of 1943 Alum-precipitated toxoid was mainly used, in doses of 02 and 05 ml at a four-weeks' interval Few reactions occurred, but the following may be specially noted In one area 18 children developed abscesses as the result of faulty technique. In three different areas at different times 8 children in all developed paralysis of muscles innervated by the fifth and sixth cervical nerves, some of which were diagnosed as poliomyelitis Such tests of the reagent as could be made failed to detect the presence of a neurotropic virus. It is estimated that 71 per cent of schoolchildren and 56 per cent of pre-school children had been immunized by the end of 1941, and in some areas, especially the rural, 80, 90, or even as many as 95 per cent of all children had been treated Since then the response has not been maintained, and the proportion of children under 15 years now immune is thought to be not more than 60 per cent Sample post-Schick tests indicated successes in 90-99 per cent Russell states that the switch-over to gravis prevalence mentioned by Carter (see above) extended to a considerable area of Scotland and was associated with high incidence of diphtheria in 1940-41, but without material increase in fatality, in fact, during 1942 fatality was excep-Whether or no this low fatality was due to immunization, it is evident that the proportion of cases over 15 years of age has risen from 20 per cent in 1939 to over 34 per cent in 1942, and that in non-immunized children the incidence has been eight times and the fatality a hundred times greater than in the immunized More striking still, the non-immunized pre-school child was twenty times more liable to attack than the immunized child of the same age Russell suggests that the present toxoid may be weak in elements peculiar to the gravis strain of C, diphtheriæ

The Relative Merits of Different Prophylactics —A Anderson³ has compared the Schick conversion rates among 14,166 children in age-groups immunized since 1930 with toxoid anti-toxin mixture and different brands of alumprecipitated toxoid in varying dosage. Over the first period of seven years TAM in three doses gave good and durable results. On the other hand, A.P.T. has varied in antigenic potency and given a wide range of Schick conversion rates, even in larger doses than recommended by the makers. Further, the rate of loss of immunity, regardless of dosage, has been greater than with TAM. Immunity was retained longer in the youngest age-group, perhaps because the initial dosage of prophylactic was higher in proportion to bodyweight. Reactions with A.P.T. have been more frequent, but seldom severe. There are indications of recent improvement of the antigenic potency of A.P.T., but it requires checking by post-Schick tests. Anderson prefers to render a child Schick-negative at the initial course rather than relying on a later "boosting" dose at the age of school entry.

Immunity in Relation to Dosage Intervals.—G Bousfield<sup>4</sup> has examined the Schick conversion-rate among 694 Schick-positive children in the second year of life after immunization with a minimal quantity of 0.4 ml of APT at different intervals—namely, a single dose of 0.4 ml., and two doses of 0.2 ml at weekly, fortnightly, three-weeks', and four-weeks' intervals Failure of Schick conversion as tested three months after the final injection was observed in 17.5, 16.7, 12.7, 5.6, and 3.7 per cent of the children in these categories

respectively  $\,$  There are indications that an interval of six or eight weeks might give slightly better results

REFERENCES — J Hyg, Camb 1944, 43, 341, \*Proc R Soc Med 1943, 36, 503, \*Publ Hith 1944, 57, 181, \*Lancet, 1944, 2, 751

### DRUG HABITS OF A MINOR KIND IN INDIA.

Macdonald Critchley, M.D., FRCP

A paper by R N Chopra, G S Chopra, and I C Chopra¹ is of interest as illustrating the extent and manner to which oriental races make use of pharmacological stimulants, exhilarants, and sedatives The Chopras speak of these adventitious measures as "dopes", and they state that in India, where conditions of life are becoming more difficult, the hard-worked people are more prone to try and increase their physical and mental output by such adjuncts

Thrdly, consciousness is in no way diminished, and mental and physical work continues without impairment Lastly, "dopes" may include substances which have pharmacological actions outside the central nervous system, as, for example, on the respiration or circulation

Drugs.—Four groups of "dopes" can be discerned (1) Substances, either stimulants or sedatives, which act by way of the nervous system, (2) Drugs, whether stimulants or depressants, which act by way of the cardiovascular system, (3) Hormone preparations, mediating via the endocrine system, and (4) Metallic preparations such as arsenic and mercury

Group 1 includes the stimulants (alcohol, ether, smelling salts, benzedrine, cocaine, caffeine, strychnine) and the sedatives (opium, barbiturates, chloral, paraldehyde, coal-tar derivatives, aspirin, bromides, valerian)

Alcohol, in dilute form and in moderate amount, is commonly taken by the male and female workers in the coal-mining districts of Bengal and Bihar after their day's monotonous and arduous work. Certain rice beers, such as Pachevai and Zu, have considerable nutritive value and high vitamin content, and may be taken to the exclusion of milk by such stalwart races as the Nagas

Smelling salts are commonly used by sedentary workers in the larger towns of the Bengal, Bombay, and Madras Presidencies Indulged to excess they may produce rhimitis, sinusitis, and headaches. Prolonged use has been known to lead to a craving

Snuffs, made of powdered tobacco leaves, saffron, chillies, lime, and Kaner flowers are commonly used by the middle and lower classes in India

Cocaine eating prevails among the artisan classes in the larger cities of India Between 30,000 and 40,000 cocaine-eaters are believed to exist. The drug is incorporated with betel leaves Ill-effects show themselves earlier than with any other drug

Benzedrine addiction has been known to occur in India among the professional classes, and especially doctors

Opium taking in small and irregular doses is a common practice in India In the Punjab many persons take ½-1 gr daily during the cooler seasons with the idea that it protects against colds and coughs Others take small doses during the arduous work of gathering the harvest

Barbiturates may be taken in India by libertines and prostitutes for sex gratification, in addition to their common employment as sedatives by neurotic

or unstable individuals. Chloral, mixed with tea or alcohol, has been used of late in many parts of India

Group 2 includes the cardiac stimulants camphor, cardiazol, coramine, and ephedrine, as well as the depressant drugs nitroglycerin and trinitrin. These last are seldom used in India.

Camphor is frequently taken in India, sometimes incorporated within a betel chew, sometimes in the form of a pill. It is a common ingredient in various household remedies, and is an important item in Ayurvedic medicine

Group 3 is made up of endocrine preparations. These do not differ materially in their employment in India from the accepted European use. The authors quote the observations of Okamoto, however, who has advocated the use of Pelanin (a follicular product) for women athletes when it is desired to inhibit or postpone the menstrual flow for some days

Group 4, comprising arsenicals and mercurials, is much used in India

Arsenic is often taken habitually, especially in Northern India, for divers reasons—as an alleged tonic, to improve the complexion, as a prophylactic against tubercle, as a stomachic, and as an aphrodisiac. The drug is usually mixed with butter or with sugar. Arsenic is not a euphoriant and does not lead to any marked craving, though abstinence symptoms (epigastric pain, diarrhœa, tiredness, and even collapse) have been described.

Mercury is a component of such indigenous drugs as Shingraf and Makaradhwaja Mixed with honey or butter, it is often taken habitually as a sexual and general tonic

Foods.—In the second part of their paper the authors discuss the foods and dietetic preparations which are used for stimulating or for doping purposes. The use of vitamin preparations, phosphates (Grimault's syrup), calcium salts, and laxatives is only too common in India

Food accessories, e.g., purine derivatives, are discussed. Tea and coffee are taken habitually by millions of Indians. But cases of excessive indulgence are rare, and even in these no serious or lasting damage to the system could be detected.

Betel—An interesting account is given of the prevalent habit of betel chewing. It is estimated that there are between 5 and 10 million betel chewers in India. The Pan-supari, or betel chew, consists of a betel leaf wrapped around a piece of areca nut, some burnt lime, a few spices and aromatics, and sometimes tobacco. Most consumers use about 2–10 such morsels in the course of a day, while up to 200 morsels may be the daily ration of an addict. The offering of a betel morsel is a social rite or courtesy among orientals, in the same way as a digarette serves among westerners. It is commonly offered before and after meals, because of its reputed carminative and sialogogic properties. By virtue of its perfume and its alleged aphrodisiac action it forms part of the ritual whereby a wife welcomes her husband, and the practice has spread to prostitutes, who offer it to their clients. In addition, a number of medicinal properties are believed to be contained within the Pan-supari

The present authors have studied the effects of betel chewing among over a thousand persons. Shortly after placing the morsel in the mouth there is a mild irritation of the mucous membrane which leaves a pleasant odour to the breath and a mild feeling of exhibitant. This last is due to an alkaloid contained within the nut, called arecoline, which is a central nervous excitant.

The authors have demonstrated that working capacity is slightly increased, and that mental facilities are improved as shown by quicker solution of arithmetical problems and fewer errors

Ill-effects of betel chewing are seen only in cases of excessive consumption. The commonest sequelæ consist in pyorrhæa, dental caries, deposition of black tartar on the teeth, and dyspepsia. It is also claimed that the habit predisposes to carcinomatous growths of the mouth

REFERENCE -1 Indian med Gaz 1942, 77, 84, 107

DUCTUS ARTERIOSUS, PATENT. (See PATENT DUCTUS ARTERIOSUS)

### DUODENUM, CARCINOMA OF. A Rendle Short, M D, F R C S

Primary Carcinoma of the Duodenum.—Carcinoma of the duodenum presents itself in two forms, according to whether the ampulla of Vater and the head of the pancreas are or are not primarily involved. Papers have appeared by J. W. Howard, of Massachusetts, and Isidore Cohn, of New Orleans, on those growths which do not involve these structures and do not cause jaundice.

Howard has seen 8 examples of primary cancer of the duodenum in the post-mortem room. They were not situated at the ampulla of Vater and did not arise in the pancreas. These growths do not arise in pre-existing ulcers. The first, second, or third portions of the duodenum may be involved. They usually give rise to stenosis, with symptoms of obstruction. Metastases are late and uncommon. The symptoms are vague epigastric discomfort, anorexia,

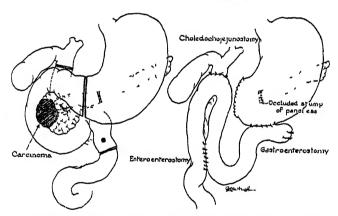


Fig 19—Left Diagram showing transections (double lines) for one-stage puncreato-duodenectomy, in excision of carcinoma of head of pancreas Right Termination of operation—re-establishment of continuity of upper alimentary tract by gastro-enterostomy, choledocho-jejunostomy, and entero-enterostomy. The stump of pancreas is occluded (Reproduced from 'Surgery, Gynecology, and Obstetries'.)

loss of weight and strength, and, later, vomiting and obstruction signs Occult blood is present in the stools, and there is usually achlorhydria Jaundice is rare Barium meals and X rays have been of uncertain value

Cohn comments on the insidious onset of these growths, they are often asymptomatic until obstructive symptoms arise, and pain and jaundice are absent. In one of his two cases he was able to resect the tumour by the Polya technique, but the patient only lived a few months

Carcinoma of the Ampulla of Vater.—C. G Child, of New York, reports a successful case of removal of a carcinoma in the region of the ampulla of Vater, causing jaundice and loss of weight. The growth was 2 in across The steps

of the operation were division of the common duct, the jejunum, and the lower end of the stomach, then the pancreas was cut across and the tumour removed. The final stages were end-to-end gastro-jejunostomy, pancreatico-jejunostomy, end-to-end, and cholecyst-jejunostomy, side-to-side. The time taken was five hours. A good recovery was made, but the growth recurred 14 months later

A. Brunschwig, of Chicago, describes 8 cases treated by one-stage pancreatico-duodenectomy Four patients died within a few days, and two after four or five months. Two patients got well, and were in good condition 6 and 16 months later. His method is quite different from that followed by Child, as will appear from the diagrams (Fig. 19). The end of the stomach is closed and a gastro-jejunostomy performed, the end of the dilated common duct is implanted into the jejunum, and the pancreatic duct is ligatured. A jejuno-jejunostomy is added to avoid kinking. Tying the common duct and joining the gall-bladder to the stomach and jejunum is apt to be followed by bile leakage from the duct. He doubts the necessity, or the success, of implanting the pancreatic duct into the jejunum.

C G Child, of New York, adds 7 personal cases of radical removal of the head of the pancreas for carcinoma. One patient died soon after, and two more eight and fourteen months later. Two were alive and well after one and four years, two more were recent but promising. He recommends anastomosing the pancreatic duct to the jejunum, and describes a suitable procedure, by end-to-end junction

REFERENCES — Amer J med Sci 1943, 2, 735, Ann Surg 1944, 119, 842, Jud 1948, 118, 838, Surg Gynec Obstet 1948, 77 581, Ann Surg 1944, 119, 845

### DUPUYTREN'S CONTRACTURE Lambert Rogers, M Sc, F R C S.

During the year an important paper on Dupuytren's contracture has come from Australia Analysing his own series of cases as well as a number of recorded ones, C E Corlette1, of Sydney, comments on (1) the strong evidence that the condition is hereditary, (2) its occasional occurrence in the plantar fascia as well as in the palmar fascia of affected individuals, (3) its tendency to be bilateral and the fact that it often begins in the left hand, (4) its frequent occurrence in those who have never done manual labour, (5) its failure to appear in the part of the hand likely to be traumatized and its presence instead on the ulnar border The 3rd, 4th, and 5th of these points are against its being an occupational disease produced by repeated mild trauma, as has so often been suggested. It is six or seven times as common in men as in women, appears usually in the forties, and begins as a small nodular thickening in the skin of the palm just proximal to the distal crease line and in line with the ring finger, less often with that of the little finger Beyond the primary nodule is a small depression. As the condition progresses the nodule enlarges and becomes a ridge and then contracture occurs, but in some individuals the condition may not progress and may remain stationary in the nodular stage. Corlette believes that mild non-progressive cases may be much more frequent than has hitherto been suspected. The condition has been recorded by H Crouch<sup>2</sup> in identical twins, in whom it occurred at identical ages, another point in favour of its being a familial condition. Corlette advocates early and thorough operation under local analgesia for advancing cases, but advises conservatism where the disease is ceasing to progress

The importance of this stimulating paper is the evidence for the disease being an hereditary hypertrophy of the palmar aponeurosis with a consistent general pattern and not an acquired condition due to trauma or toxæmia as it has so often been regarded in the past. The conclusion that all cases of Dupuytren's

contracture are familial, and that its preponderance in males in the rate of nearly 7 1 is capable of a Mendelian explanation, appears to fit the facts better than has hitherto been the case with other suggestions as to the aetiology.

REFERENCES -1Med J Aust. 1944, 2, 177, Canad med Ass J 1938, 39, 225

DUST INFECTIONS. (See Air-Borne and Dust Infections)

DYSENTERY, AMCEBIC. (See AMCEBIC DYSENTERY)

### DYSPEPSIA AND PEPTIC ULCER IN THE SERVICES.

Sir Henry Tidy, M.D., FRCP.

Captain Alexander Rush¹ (Medical Corps, Army of the United States), under the title "Gastro-intestinal Disturbances in the Combat Area", reviews the experiences in a large hospital in the South Pacific close to the zone of combat. Of the total medical admissions 6 per cent were admitted for gastro-intestinal disorders. The report deals firstly with peptic ulcer and secondly with functional disorders of the digestive tract.

There is no separation of peptic ulcer into gastric and duodenal types Pentic ulcer was diagnosed in 1 per cent of all medical admissions, representing approximately 19 per cent of patients admitted for gastro-intestinal disorders It is noted that these proportions are much lower than those found in most reviews of gastric disturbances in the Services, and is only higher than those recorded for the New Zealand forces in the Middle East. The hospital concerned was drawing patients directly from combat troops in the field who had already to a considerable extent been screened out for peptic ulcer results are of special interest, although not necessarily comparable with the results published from other large general hospitals. Approximately half of the patients with ulcer gave clear-cut histories of previous attacks. A typical peptic history was obtained in 80 per cent of the patients with ulcer, in 20 per cent the history was misleading Difficulties arose from soldiers learning that a certain set of symptoms are associated with peptic ulcer and that this disease is one for which they would be sent home X-ray evidence was obtained in 67 per cent of cases diagnosed as ulcer, but a crater was demonstrated in only 51 per cent of the patients with positive X-ray signs, though a patient, given positive X-ray evidence, was considered to be positive in the absence of a crater In no case was a peptic ulcer found in a patient who had no free hydrochloric acid in his gastric secretion, but fractional gastric analysis was not found of use Little reliance was placed on a positive benzidine reaction for occult blood in the stools Great reliance was placed on Palmer's acid test, in which 200 c c. of hydrochloric acid in physiological concentration is injected into the stomach. In cases with peptic ulcer there is prompt and typical epigastric distress, relieved by aspiration of the acid solution followed by instillation of a solution of sodium bicarbonate. No such result was obtained in cases attributed to functional disturbances In cases with peptic ulcer there was a prompt response to treatment, severe cases being given a continuous alkaline milk drip for a period of 48 hours. The pain rarely persisted for more than a few days, in contrast to patients with functional gastrointestinal disturbances in which treatment almost uniformly failed to produce At the commencement there was an attempt to give a thorough course of treatment and rest and then return the man to duty. But this experiment failed, and it became the policy to recommend the transfer from the combat zone for every patient known to have or who was suspected of having gastric ulcer

The second part of the communication deals with cases judged to be functional disturbances of the digestive tract. The author classifies the group into four

general types based on the outstanding symptoms (1) A syndrome of transient abdominal cramps coming on after eating and made worse by the taking of certain coarse foods He attributed this type to an irritable or spastic colon and includes in it 80 per cent of the patients (2) Dominating symptoms of nausea and vomiting, accounting for 10 per cent (3) Symptoms resembling peptic ulcer, comprising 7 per cent (4) Aerophagy, comprising 2 per cent In contrast to the symptoms of peptic ulcer the functional group are in discomfort almost continuously and have no period of relief Physical and X-ray examinations are negative Response to therapy is poor, and 58 per cent of the patients show no improvement. Of those who show a good improvement 90 per cent have experienced symptoms for no longer than twelve months All of the patients were found to be in a state of either acute or chronic emotional ferment The Army General Classification Test placed a high percentage in low grades, of those admitted to hospital for the first time 88 per cent were returned to duty, but only 56 per cent of those with more than one admission Sending patients to a labour battalion was considered to make them worse The decision as to whether a patient should be transferred to the Base was largely made on the results of the Classification Test, but in many cases was based on the report of the commanding officer

[This is an interesting study from a hospital draining a combat area. With regard to peptic ulcer the proportion of cases proved positive by X rays appears to be somewhat low. We are not accustomed to place so much diagnostic reliance on the acid test. The functional group appears to have received more examination and treatment than is considered advisable in the British Services, in which it has been found that the best results are obtained by returning such men to duty or transferring them elsewhere after the shortest possible stay in hospital—H T]

Brigadier Harold Edwards and Lt -Col W S C Copeman<sup>2</sup> (British Army). working in the Gastric Unit of a Military Hospital in England, publish the results of a special scheme of investigation of cases of dyspepsia which had the additional aim of furnishing data for statistical research. In order to obtain an unbiased report the data were committed to an independent statis-Unfortunately his ignorance of medical problems resulted in certain disadvantages-for example, the lumping together of gastric and duodenal ulcers The report is mainly concerned with the contrast between ulcer and non-ulcer cases The total number investigated fully was 356, of which 139 were proved to be ulcers and 217 non-ulcers Among the interesting differences between the two groups are the following. Of civilian occupations miners gave a high percentage in the non-ulcer group, suggesting that they may be subject to a type of dyspepsia in which ulceration does not occur. In about one-third of the cases in both groups, ulcer and non-ulcer, the symptoms began during civilian life There is thus no evidence that army service has any influence upon the development of non-ulcer dyspepsia as opposed to ulcer dyspepsia. A family history of dyspepsia was found in about 55 per cent of both groups There was no recognizable difference in drinking or smoking Duration of symptoms was about six years in both groups, but the age of onset was earlier in the non-ulcer group Nocturnal pain was significantly more common in the ulcer group, so, too, was the average interval between food and pain, and the presence of a considerable period of freedom after food was significant of There was no significant difference in the occurrence of nausea, vomiting, or flatulence between the two groups. Vomiting occurred in over 76 per cent of cases of ulcer [The unusual frequency of vomiting in all forms of dyspepsia in the army has been previously noted ] The percentage of ulcer cases in which pain was relieved by food or by alkalis was significantly higher than in the non-ulcer group Further, in most ulcer cases the pain is relieved by both alkalis and food, while in non-ulcer cases food usually fails to relieve, and alkalis usually do so These findings are regarded as of the greatest diagnostic importance [The question whether the action of alkalis in the non-ulcer group is psychological is not discussed] By gastroscopy gastritis was diagnosed on 23 occasions, but only on 3 occasions was a gastric ulcer found when the radiological diagnosis was in doubt. The disappointing results of a statistical analysis of this investigation are largely due to the statistician's ignorance of medical problems.

Lt.-Col H R Love<sup>3</sup> (Australian A M C) publishes a study of "Dyspeptic Symptoms in Soldiers" from an Australian Base Hospital, between August, 1941, and December, 1942. Of 15,380 admissions, 908 (5 9 per cent) were admitted with diagnoses of various types of dyspepsia. The report is based on 358 patients admitted between July 1 and Dec 31, 1942. Of these 68 per cent had suffered from dyspepsia prior to enlistment for very varying periods, with an average duration of 61 years. The periods of army service averaged 10 months. In the group of dyspepsia developed since enlistment, the average length of service prior to admission was 22 7 months, and the average duration of symptoms was 10 7 months. Duodenal ulcer was diagnosed in 9 3 per cent, duodentis and irritable duodenum in 8 5 per cent, pylorospasm in 2 7 per cent, and gastric ulcer in 4 7 per cent. Under miscellaneous functional disorders, 62 per cent are included with positive radiological findings. The remainder are almost entirely "functional dyspepsia" or neurosis. There were no gastroscopic examinations. The article consists mainly of a careful study of different types of pain and their interpretation.

Rudolf Schindler, H Montgomery, and O Underdahl4 (United States Naval Reserve Medical Corps) have carefully studied a small group of naval personnel presenting symptoms of gastro-intestinal disturbances with special reference to gastroscopic and psychiatric investigation. They studied 45 unselected patients who fall into two groups after investigation Group 1 consists of 28 instances in which peptic ulcer, in every case duodenal, was revealed by X-ray examination Gastroscopy revealed only 2 cases in which severe gastritis was present, and a further 5 in which there was a mild degree The authors take it that only the two severe cases correspond to the frequent instances of severe gastritis, combined with duodenal ulcer, encountered so regularly in civil prac-Psychiatric interviews in this group did not reveal anyone suffering from severe psychoneurosis at the time of examination, but two patients had moderate and four had mild neurotic symptoms. In no instance in this group were the patients' neurotic symptoms severe enough to suggest discharge from the In Group 2 were 22 cases in which peptic ulcer was not demonstrated either by X-ray examination or by gastroscopy In this group there were 6 cases with severe gastritis of various types and 5 cases with mild gastritis In the remaining cases gastroscopy proved the gastric mucosa to be entirely normal Psychiatrically there were 11 cases with definite psychoneurosis Of the remaining 11 patients, 6 had mild but very definite neurotic symptoms. and only 5 were considered not neurotic, although 2 of the latter were restless and highly strung Summanzing the differential diagnoses in this group, it is stated that of the 22 cases, in 11 the diagnosis was made by gastroscopy, and in 9 of the remaining by psychiatric investigation. In the other 2 cases no abnormality was found. The authors conclude that from this small series of patients it would appear that the usual subject suffering from a duodenal ulcer is not in need of gastroscopic or psychiatric examination unless there is specific indication Both these examinations are essential in making the final diagnosis for the group not having duodenal ulcer [The absence of severe gastritis in

cases of duodenal ulcer has been recently recorded by other observers, but most investigators have found a greater degree of psychoneurosis than in the present series —H T]

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### ELECTROCARDIOGRAPHY

William Evans, M.D., FRCP

Trilene Anæsthesia.—C G Barnes and J Ives¹ recorded electrocardiograms throughout operations performed on 40 otherwise healthy patients during light trilene anæsthesia. Only 7 patients showed no cardiographic changes Very many varieties of arrhythmia were observed, and it was common for a patient to exhibit several of these successively as the anæsthetic continued For the most part the irregularity was innocent and included sinus bradycardia and extrasystoles, but partial or complete heart-block and paroxysmal tachycardia were present in some cases. The authors stated that their results suggested that trilene anæsthesia was dangerous, especially if adrenalme was used as well, and they recommended that it should not be employed as a routine adjuvant to gas and oxygen, although only one death had been reported from its use up to that time

Artificial Hyperpyrexia.—Among 80 cardiograms taken following therapeutic fever, A H Clagett² found that 64 showed insignificant changes, 7 showed significant changes, and 9 no change, from the pre-fever tracing. The common finding of S-T depression reported by other observers could not be confirmed, it was only depressed in a few cases Slight increase or decrease in the amplitude of the P wave or QRS complexes was a common finding associated with the invariable tachycardia. There were three instances of cardiac infarction, and six others showed significant though transient changes

[Such findings emphasize the risks attendant on this treatment even in otherwise healthy patients. When the benefit of this therapeutic procedure is still doubtful, its hazards should be given a prominent place —W E]

Cardiac Infarction.—The diagnosis and location of the infarct were considered by S Baer and H Frankel<sup>3</sup> in 378 cases of acute myocardial infarction Electrocardiograms taken in 321 cases disclosed infarction in 94 per cent. On cardiographic study alone, 52 per cent of infarcts were found to be anterior and 34 per cent posterior; of 74 patients coming to necropsy, 70 per cent had anterior, 23 per cent posterior, and 7 per cent anteroposterior infarction. They considered that anterior infarction was more serious than posterior infarction, in addition to being more common. Although infarction of the anterior wall of the left ventricle is more apt to be missed by electrocardiography than the posterior variety, cardiographic diagnosis and location of the lesion are eminently accurate.

Cardiac Infarction of Lateral Wall of Left Ventricle—The electrocardiographic pattern of infarction of the lateral wall of the left ventricle was first described by F C Wood, C C Wolferth, and S Bellet Among the typical changes were the following depression of the RST segment in Leads I, II, and IVR, absence of characteristic abnormalities in Lead III, and a high incidence of auricular fibrillation. The resemblance to digitalis effect in the S-T segment was noted, and thrombosis of the left circumflex artery was found to be responsible for the infarction.

H W Thomson and H Feil<sup>5</sup> described the cardiograph findings in 19 cases, in 9 of which the lateral infarct had been recent of these recent cases 4 showed the pattern described by Wood and his colleagues found in 5 of these recent examples. In the 5 recent cases without cardiographic changes typifying lateral infarction the tracing indicated posterior infarction.

Myotonia Atrophica.—Examination of the heart in 18 cases of myotonia atrophica has shown that the presence of cardiovascular signs may help in the earlier diagnosis of the condition (W Evans<sup>6</sup>) The pulse is often small and occasionally infrequent. The blood-pressure is sometimes very low. The changes that commonly characterize the electrocardiogram include elongation of the P-R period, low voltage of the P wave, slurring of the QRS complex, and left axis deviation. The size of the heart varies so that it may appear normal or small, but in the presence of considerable lengthening of the P-R period moderate enlargement takes place.

Potassium Poisoning.—C A Finch and J F Marchand have reported on the clinical, serological, and cardiographic findings in two patients with renal failure in whom demise was expedited by excessive medication with potassium The cardiographic diagnosis had been made possible by the work of A W Winkler, H E Hoff, and P K Smith,8 who showed that a slow increase of the serum potassium in dogs was accompanied by the following abnormalities progressive elevation of the T waves, depression of the S-T segment, intraventricular block, loss of P waves, and finally cardiac arrest, ventricular fibrillation did not occur as long as the infusion of potassium salt was given slowly The clinical course of human potassium poisoning, as illustrated by the two published cases, showed parallel features as the result of the underlying renal disease as well as potassium toxic effects. In each there was uræmia with oliguria, nausea and retching, episodes of bradycardia unaccompanied by symptoms of cardiac failure or changes in blood-pressure. sudden ascending flaccid quadriplegia, electrocardiographic changes, including elevated T waves, absent P waves, intraventricular block, terminal irregularities of the rhythm, and arrest of the heart in diastole prior to cessation of respiration

Pulmonary Embolism.—The findings in 10 cases of acute cor pulmonale without underlying heart disease have been reported by D Murnaghan, S. McGinn, and P D White, five of them had proved fatal They emphasized that 'pulmonary embolism' and 'acute cor pulmonale' were not synonymous terms Varying degrees of acute cor pulmonale occur, and the electrocardiogram provided a means of calculating the status of the heart, especially when clinical signs of right-sided heart strain are not obvious They confirmed a typical cardiographic pattern in acute cor pulmonale it is characterized by right axis deviation with a prominent S wave in Lead I, depressed S-T segment in Lead II and often in Lead I, Q wave and inverted T wave in Lead III, and a diphasic or inverted T in Lead IVF

David Lewes<sup>10</sup> recorded the clinical and cardiographic progress of a patient who recovered from severe pulmonary embolism taking place eight days after hysterectomy. A cor pulmonale developed in the absence of radiological evidence of pulmonary infarction. He emphasized the value of triple rhythm, from the addition of the third heart-sound, in the diagnosis of suspected cases of pulmonary embolism. Radiographic evidence of distension of the right auricle and right ventricle coincided with the onset and duration of the cardiographic changes. He found that inversion of the T wave in CR<sub>1</sub> was the most sensitive of the cardiographic indices of right ventricular failure, and he confirmed the value of this change and of the absence of T wave inversion in Lead CR<sub>7</sub> in the diagnosis of acute cor pulmonale and posterior cardiac infarction.

REFERENCES — Proc R Soc Med 1944, 37, 528, Amer J med Sci 1944, 208, 81; Arch uniem Med 1944, 73, 286, Amer Heart J 1938 16, 387, Amer J med Sci 1944, 207, 588, Heart J 1944, 6, 41, Amer J med Sci 1948, 206, 507, J clin. Invest 1941, 20, 119, Amer Heart J 1943, 25, 573, Heart J 1944, 6, 161

### ELECTRO-ENCEPHALOGRAPHY IN OTITIC BRAIN ABSCESS.

F W Watkyn-Thomas, FRCS.

In the Medical Annual for 1941 (pp 107-116) W Grav Walter and F L Golla described the principles and technique of this procedure They mentioned that some successful cases had been reported in the localization of brain They noticed that the electro-encephalogram closely resembled that found in malignant brain tumours Since their paper was published a great deal more work on the subject has been done M A Rugg-Gunn and S C Suggitt1 describe a case in which electro-encephalography, carried out three times, showed the whole course of the condition At the first examination a focus of well-defined delta waves of low potential suggested a destructive but comparatively benign cortical lesion in the right temporo-parietal region, extending backwards Six weeks later the focus was well down in the frontal lobe, with delta waves ten times greater in potential than at the first examination, and small diffuse delta discharges It is probable that these were due The absects to an acute œdema of the cortex and raised intracranial pressure was found and drained on the following day, and three weeks later the whole of the frontal, temporal, and parietal areas were free of abnormal discharges. There were still definite delta discharges in the occipital region, due probably to interruption of the visual tracts either by disease or by operative injury.

R S Schwab and R Carter<sup>2</sup> record 503 cases in which localization was made by electro-encephalography with careful follow-up. The cases were classified in three groups. (1) Positive localization. Here a fairly clear electrical focus could be seen. In these surgery or autopsy proved the diagnosis correct in 85 per cent. (2) Doubtful localization, where the discharges were diffuse, and only a guess could be made as to the area affected. Correct in 55 per cent. (3) Negative localization with a normal encephalogram. A clinical follow-up showed 91 per cent correct.

In these cases, which included all kinds of brain lesion, there were 15 proved cases of brain abscess. In 7 the encephalogram gave an accurate localization of the abscess. In 7 the waves were abnormal, but diffuse. In only 1 was the result negative, here the abscess was in the cerebellum

[On this evidence it seems clear that electro-encephalography is a most valuable method of diagnosis, especially in brain abscess. Other methods of encephalography are not free from risk in such conditions, and in the temporal regions diagnosis is notoriously difficult, although the recent work of ('S. Hallpike, T. E. Cawthorne, and G. Fitzgerald (Medical Annual, 1943, pp. 190-192) is most encouraging. The only difficulties in the way of wider use of the electro-encephalogram are the provision of sufficient instruments (which must, of necessity, be delicate and difficult to construct) and sufficient experimence in the study of the charts—F. W. W-T.]

References -1 Laryng 1942, 57, 89, Laryngoscope, Lond 1942, 52, 757

### EMPHYSEMA, PULMONARY Maurice Davidson, M.D., F.R.C.P.

The mechanism of emphysema of the lungs has long been a subject of speculation, and although numerous hypotheses have been advanced to explain it and the arguments in their favour have been sedulously copied from one text-hook to another, little real advance in our knowledge of the subject appeared for many years. The confusion of thought which has existed for long enough in regard to the clinical aspects of the disease has been due to a similar lack of exact knowledge, and the same process of repeating the traditional explanation madequately supported by accurate scientific evidence, continued until the somewhat shattering confessions of the late Prof. R. Cabot appeared to their the complacent self-confidence of many accredited clinicians. In his Gouleton in

lectures for 1943, Prof R V. Christie<sup>1</sup> has given an extremely interesting and careful review of the whole subject and has, by the most comprehensive discussion of the experimental and clinical aspects of emphysema and the cardiovascular and hæmic changes associated with it, rendered an invaluable service in clarifying the whole position and in assisting the clinician in the formation of a more accurate conception of this condition

In the earlier part of the discourse the author deals with the nature of the lesions in chronic vesicular (hypertrophic) emphysema of the lungs as shown both by observations on the living subject and by post-mortem evidence One of the salient points among his conclusions is that while in emphysema the lungs altogether do generally contain more air than normal, this never amounts to an increase greater that that which occurs in a normal individual on taking a moderately deep breath In other words, "there is certainly never evidence of true over-distension or overstretching of the lungs as a whole" [my The appearance of enlargement of the lungs in the post-mortem room is due to the fact that they do not collapse, and the microscopical appearances of considerable over-distension of the alveoli is due mainly to destruction of the alveolar wall and the fusion of air spaces The loss of elasticity of the lung he regards as occurring at a comparatively early stage of the disease, since measurements of this factor during life in 3 cases, based on observations of the intrapleural pressure, have shown that in emphysema the intrapleural pressure is not always negative as in health even at the end of a full inspiration it may equal the atmospheric pressure and it may be unaltered after collapse of the lung by a pneumothorax For these and other reasons he shows that loss of elasticity can explain the expansion of the thoracic cage and the real overdistension of air-sacs, with formation of bullæ on the surface of the lung failure of emphysematous lungs adequately to ventilate the blood is strikingly illustrated by the table given showing the result of analysis of the arterial blood in three cases of pulmonary emphysema of varying severity, the causes of the impairment of the hæmo-respiratory exchange are discussed, and the fallacies of many of the traditional explanations are shown. Since almost all the symptoms and signs of the disease and the over-distension of air-sacs with formation of bullæ are explicable on the basis of loss of elasticity, it is suggested that it is the wastage of ventilation on this "pathological dead space" which accounts for the dyspnæa and the alterations in the hæmo-respiratory exchange which accompany and characterize the condition

In the second part of the paper Christie deals with the physical signs which accompany emphysema and shows how loss of pulmonary elasticity may explain many of these, as it does the enlargement of the thoracic cage. In the formation of the 'bariel chest' he thinks there are several contributory factors, but he insists that although these are not entirely independent of each other their relative importance probably varies from patient to patient. In addition to two arising from the loss of pulmonary elasticity, namely, the inspiratory position of the chest and the expansion of the lung between the heart and the sternum, there is also the dorsal kyphosis which may produce an increase in the anteroposterior diameter of the thorax, and, finally, the diminishing flexibility of the chest wall that occurs with advancing age. The diagnosis of this condition he admits to be a matter of no little difficulty in view of the conflicting views that have been expressed by clinicians of experience, and while disclaiming the suggestion of some writers that the physical signs of emphysema are meaningless, he admits that the text-books are "misleading, to say the least, in the neat array of physical signs which they present "

The outstanding message of these lectures is their demonstration of the fallacy of thinking of hypertrophic emphysema in terms of over-distension

and over-stretching of the lungs, and their insistence on the importance of searching for some factor which causes destruction and degeneration of many of the structures concerned in respiration, both in the lung and outside it [my italies] Most instructive is the author's summing up of the value of physical signs taken in conjunction with symptoms, and his conclusion that diagnoses of emphysema based on physical signs alone are unreliable, depending as they do on the barrel-chest phenomenon, which, as Cabot pointed out, was not found to be consistently correlated with anatomical evidence of the actual disease. The existence of dysphæa of insidious onset (not caused by bronchospasm or ventricular failure) in a patient having some of the physical signs of emphysema, together with a history of chronic bronchits or asthma, is the only combination which would seem to make the diagnosis reasonably certain

RETERENCE -1 Lancet, 1944, 1, 105 and 143

### ENDOCARDITIS.

William Evans, MD, FRCP

Rheumatic Endocarditis.—A Juca and P D White1 have described 100 unselected fatal cases of rheumatic heart disease over the age of 20 years at death and examined post mortem A history of rheumatic fever was obtained in 57 and the average duration of the disease was 24 years Rheumatic fever as a cause of death was less in adults than in children, in the former group it was present in only 24 per cent of the cases, while in the latter group it was present in 75 per cent Heart failure without the exciting factor of acute rheumatic fever was a minor factor as a cause of death in children (only 7 per cent), while in adults it was the chief cause (35 per cent). Among a total of 35 cases of heart failure, auricular fibrillation was present in 13, pneumonia in 10, and pulmonary infarction in 10 Bacterial endocarditis was met with in 18 per cent of the patients, in this group the association of mitral and aortic lesions predominated, and it seemed that in theumatic heart disease those patients who show the combination of mitral and aortic lesions are more likely to develop bacterial endocarditis Finally, it was found that the heart weight was maximal in the series of patients who died of heart failure and

minimal for those of the group "causes unrelated to the heart"

Tricuspid Stenosis.—Of 119 consecutive patients who died of rheumatic heart disease and were examined at necropsy, C F Garvin² found that 48, or 36 per cent, showed involvement of the tricuspid valve, and that in 18 of these the process had advanced to definite tricuspid stenosis. No new symptoms or signs, helpful in the diagnosis, were found, but the study emphasized that whenever tricuspid insufficiency was diagnosed, some amount of stenosis could be presumed present. Again, it was found that marked stenosis of the tricuspid valve did not prevent the appearance of the phenomena of tricuspid insufficiency such as pulsation of the jugular veins and of the liver

Sulphonamides in Bacterial Endocarditis.—W T Cooke and A B Taylor³ treated 5 patients with combined chemotherapy and intravenous heparin All patients died, one probably as the result of the heparin treatment. Twenty patients (including the 5 treated with heparin) were treated with sulphonamide compounds. Five were totally unresponsive and 12 were moderately controlled. Life was prolonged in some, but all eventually died. Three patients became apyrexial, one died after 45 days of normal temperature, but as there was no necropsy neither the diagnosis nor the state of the lesion could be determined, a second died one year after the onset of his infection and eight months after the control of pyrexia by sulphapyridine necropsy showed healed lesions of bacterial endocarditis; the third was well and working 12 months after discharge from hospital. Intravenous heparin did not prove of value in these cases. Prolonged chemotherapy offered a chance of cure to a

few patients, though the great majority were not so benefited. The dangers of such prolonged therapy are not great and should not weigh against the chance of a successful outcome, small as this might be

Pencellin in Bacterial Endocarditis.—In the first large series of miscellaneous cases reported (C S Keefer and his colleagues<sup>4</sup>), penicillin was given to 21 patients, 4 died, no effect was obtained in 10, 3 improved temporarily but 2 soon relapsed. Some of these patients probably received inadequate doses In later reports the findings are somewhat conflicting

W E Herrell<sup>5</sup> treated 4 cases, achieving only temporary improvement in all M H Dawson and G L Hobby<sup>6</sup> treated 5, of which 2 were failures, 1 was improved, and 2 were alive and well thirteen and nine months later

More encouraging results were obtained by L Loewe and his colleagues,7 who treated 7 patients, 2 of them were atypical in that the organisms concerned were a pneumococcus and a hæmolytic streptococcus, but the remaining 5 were examples of Str viridans infection in valves damaged by rheumatism. After intensive sulphonamide treatment, which had failed, they were given penicillin in large doses, usually 200,000 units a day, with a total dosage of over 7 millions in 2 cases and 6 millions and 3 millions in 2 others, combined with 200 mg of heparin daily. All these patients apparently recovered, but the interval which had elapsed at the time of writing was only two or three months in the majority

The subject calls for a further study before a decision on its merits can be reached Meanwhile, only an improved supply position can justify the general release of penicillin for this purpose

REFERENCES — J Amer med Ass 1944, 125, 767, 2 irch intern Med 1943, 72, 104, 3 Brit Heart J 1943, 5, 229, 4 J Amer med Ass 1943, 122, 1217, 4 Ibid 1944, 124, 622, 4 Ibid 611, 4 Ibid 1944, 124, 622, 4 Ibid 611, 4 Ibid 1944, 124, 622, 4 Ibid 611, 4 Ibid 1944, 1944, 622, 4 Ibid 611, 4 Ibid 1944, 4 Ibid 1944, 622, 4 Ibid 611, 4 Ibid

EOSINOPHILIA. TROPICAL. (See TROPICAL EOSINOPHILIA)

EPIDEMIC POLYARTHRITIS. (See POLYARTHRITIS, EPIDEMIC)

### ERYTHROBLASTOSIS FŒTALIS (Hæmolytic Anæmia of the Newborn).

Reginald Miller, MD, FRCP

This subject was dealt with in the Medical Annual for 1942 (p. 124), but since then important work in the same connexion has been published. This goes not only to prove that the condition is truly a hæmolytic anæmia as suggested by L. G. Parsons, but displays the mechanism by which such hæmolysis is produced.

Summarizing the previous article -

- 1. It was taken for granted that erythroblastosis was seen in three different clinical forms (a) Hydrops feetalis, a condition of universal cedema of the feetus, (b) Icterus gravis neonatorum, and (c) Anæmia of the newborn
- 2 It was stated that at that time there was a doubt as to whether the development of the histologically characteristic extra-medullary hæmatopoiesis was a primary change as suggested by American workers, or a secondary result of the extensive hæmolysis of the fœtal blood as held by the English school. The view was expressed that, although still unsettled, the latter view appeared to be gaining ground, in which case the title of hæmolytic anæmia of the newborn became quite appropriate
- 3 The pathogenesis of the disease, the cause of the hæmolysis in the English view, remained obscure

The new work may be conveniently given under headings in the same order

1. Clinical Types.—That erythroblastosis exhibits three clinical pictures, or, put the other way round, that the three clinical conditions named above are all

part of the same disease, hardly needed confirmation Nevertheless, it is interesting to note that there have been reported mixed cases and the occurrence of the different types in siblings

- 2 Primary Change.—It seems now clearly proved that the primary change is that of hæmolysis, and that the extramedullary hæmatopoiesis is a secondary change. The opposite view of the American school was to the effect that the extramedullary hæmatopoiesis produced faulty red cells which were promptly hæmolysed (S. H. Clifford and A. T. Hertig¹, L. K. Diamond, K. D. Blackfan, and J. M. Batty²). This view must be given up as the cause of the primary hæmolysis has now been demonstrated.
- 3. Pathogenesis.—The truth of the hæmolytic theory has been established by the work of P Levine, B Levine, L Burnham, E M Katzin, and P Vogel, K E Boorman, B E Dodd, and P L Mollison, and P L Mollison This work shows that in certain special circumstances agglutinins develop in the blood of the mother during pregnancy, and passing through the placental circulation to the fœtus proceed to produce hæmolysis of the fœtal blood

The factor involved is usually, but not quite always, the hereditary corpuscular factor known as the rhesus factor (Rh), and the special circumstances which lead to the production of erythroblastosis are present when the father and the feetus are Rh-positive and the mother is Rh-negative. In such a case the mother becomes immunized by the feetal antigen and produces anti-Rh agglutinins which pass through the placenta, and, if in sufficient amount, produce the hæmolytic anæmia of erythroblastosis feetalis. In earlier pregnancies the reaction in the mother is less than in later ones, consequently, a first child has the better chance of escaping the disease

Now all these points are capable of proof by estimations of the blood-contents, so that the pathogenesis of the disease appears well established. It may be of interest to mention that in London<sup>5</sup> and in New York (A S Wiener<sup>7</sup>) the average percentage of Rh-negative persons is 15 (J F Loutit8), whereas in the mothers of erythroblastosis infants the percentage is as high as 92,4 the rest being Rh-positive and the disease in the fœtus being due to the same series of events involving the A and B factors 5 Further, as Loutit8 writes, "not all Rh-negative mothers with Rh-positive husbands (12 per cent of all matings) have affected infants The Rh-factor is inherited as a Mendelian dominant (K Landsteiner and A S Wiener<sup>9</sup>) If the father be heterozygous, Rhrh, half the offspring will be Rh-negative and therefore unaffected Even if the father be homozygous, RhRh, although all the offspring will be Rh-positive, one or more of the first children may be spared, because a greater degree of isoimmunizing stimulus may be necessary than is provided, or the mother may be unduly resistant In fact, it has been calculated (C. T Javert<sup>10</sup>) that only 1 of every 438 newborn infants suffers from one or other form of the disease"

Other recent papers dealing with this subject have been published by R R. Race, G L Taylor, D P Cappell, and M N McFarlane<sup>11</sup>, G L Taylor and R R Race<sup>12</sup>, F A Langley and F Stratton<sup>13</sup>, D H Karther<sup>14</sup>, and D. A. Nickerson and R T Moulton <sup>15</sup> In addition, A J McCall, R R Race, and G L Taylor<sup>16</sup> have published a study of a case of erythroblastosis with a Rhpositive mother

This new conception of the disease is well summed up by L E H Whitby and C J C. Britten<sup>17</sup> "The iso-immunization theory offers a simple explanation for three features of the disease, namely, the origin of the hæmolytic process in utero, the familial incidence, and the fact that it becomes progressively worse with each pregnancy"

Treatment.—The iso-immunization theory lends support to the treatment of the affected infant with blood transfusions. These may be thought to deal

not only with the serious anæmia but as a rational treatment for the intravascular hæmolysis. Should the mother, for any incidental cause, require blood transfusion, she should be given Rh-negative blood, which is now available at various maternity and blood centres.

Morbid Anatomy.—J R Gilmour<sup>18</sup> has published a long and detailed report of the pathological changes found in a series of 52 autopsies on fatal cases of all three types of erythroblastosis feetalis

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### EYE INFECTIONS: TREATMENT BY PENICILLIN.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

In view of the fact that penicillin is now available for serious infective conditions of the eye in civil practice and will be obtainable on a larger scale in the near future, the experiences in the Army of the use of this bacteriostatic agent is of interest. Its use, so far as is known, may be discussed under two headings in superficial infections (blepharitis, conjunctivitis, and infective keratitis), and in intra-ocular infections

The experimental response of superficial ocular infections of the eye with staphylococci to treatment by penicillin was shown by Robson and Scott<sup>1</sup> (1948) A series of similar clinical observations have been summarized by Crawford and King<sup>2</sup> (1944) whose findings have been confirmed by fairly extensive trials in the field Crawford and King used penicillin drops containing 250 Oxford units per c c of sterile water or an ointment of the same concentration, the base being lanette wax in water In the field concentrations up to With the use of drops penicillin is 1000 units per c c have been employed not usually recoverable from the conjunctival sac after 3 hours · instillations should therefore be at 8- to 4-hour intervals Ointment persists in the conjunctival sac for a longer period and is therefore more practicable It is to be remembered that solutions must be used freshly made up from tablets or powder, although they may be kept some days in refrigerator conditions the cintment retains its potency for periods up to a fortnight

Fortunately, most organisms affecting the eye superficially are penicillinthis, of course, is a necessary condition to treatment. In general terms, in the presence of such organisms, as a local therapeutic measure for superficial infections of the lids, conjunctiva, or cornea, penicillin is by far the best therapeutic agent known From the bacteriological point of view it eradicates sensitive organisms from the conjunctiva in a few days. It cannot, however, prevent re-infection after the cessation of treatment, and there is no reason to believe that effective therapy establishes any immunity to recurrent the organisms causing the recurrences, however, appear to be as sensitive to penicillin as those causing the original infection The usual story, therefore, is that of a rapid clinical cure in a few days in acute infections; in chronic infections there is again a rapid apparent cure with a sterile swab, but recurrences may appear which, however, themselves are amenable to similar benefit. These results apply to cases which have resisted the older methods of treatment for some time, and may be obtained even in the presence of widespread cutaneous infections such as acne or seborrhœa Excellent results are obtained with the chronic type of blepharo-conjunctivitis (usually staphylococcal) which may have resisted treatment by ordinary methods for very long periods, provided the penicillin treatment is maintained for sufficiently long (usually 6 weeks to 8 months) Corneal ulcers also are a very specific indication, particularly the difficult type of recurrent ulcer associated with conjunctival infection (kerato-conjunctivitis)

One condition which is notoriously difficult to treat is similarly controllable in the presence of penicillin-sensitive organisms—a chronically infected socket. For this perhaps the most convenient method of application is in the form of powder, a penicillin-sulphathiazole powder containing 2000 Oxford units of penicillin per gramme powder being used as an insufflation. This has been found to be a very useful prophylactic against intra-ocular infection in penetrating wounds of the eyeball, and should be insufflated into the eye at the earliest opportunity

Intra-ocular infections are in a rather different case, since penicillin injected intravenously or intramuscularly does not pass the blood-aqueous barrier and fails to reach the inner eye in any significant quantity, a failure comparable to that seen in the central nervous system The easiest method of introducing it into the eye is to inject it into the anterior chamber after paracentesis and evacuation of the aqueous—a process which can, of course, be repeated. Solutions of 1000 units per cc in water freshly prepared are used The evidence so far available in such cases (which, however, requires confirmation with a larger number of cases than are yet available) is that in hypopyon ulcers little good results-probably because the hypopyon is sterile, in actual infections of the anterior segment of the eye the result may be dramatic and an eye may be saved, but in infections of the vitreous little value results. Thus infection has been eradicated and a functioning eye retained after infective penetrating wounds or after a cataract extraction gone septic in cases which would have suggested immediate excision of the globe without the aid of this drug an effect has been found in the treatment of experimental intra-ocular infection with the pneumococcus and staphylococcus in animals by Sallman<sup>8</sup> (1943) Sallman<sup>4</sup> (1944) found, moreover, that after a single iontophoretic application of a solution of the sodium salt of penicillin, the aqueous exhibited an antibacterial activity lasting some 4 hours Further clinical work is at present in progress on the value of iontophoresis in introducing the drug into the eye or in employing it in intracorneal infections

References — Lancet, 1943, 1, 100,  $^2Brit,\, J\,$  Ophthal 1944, 28, 873 ,  $^2Arch\,$  Ophthal ,  $N\,\,Y\,$  1943, 30, 426 ,  $^4Ibid\,$  1944, 31, 1

### FAVISM OR BEAN DISEASE.

Sir Philip Manson-Bahr, CMG, DS.O, M.D, FR.C.P. Interest and speculation have alike been rekindled by the remarkable phenomena of this example of allergy, especially as the problem it presents is analogous, in many ways, to that of blackwater fever

Favism is caused by inhaling pollen from flowers of the bean (Vicia faba) or by eating them. It is most frequent in Italy, S. Sicily, Corfu, Greece, N. Egypt, and Sardinia, where the morbidity rate is as high as 15-17 per cent and the case mortality rate 8 per cent. Ingestion of the raw beans appears more likely to cause it than when cooked, but one-half at least of the cases are due to the blooming plants, which would seem to indicate that some form of allergy is at the basis of the syndrome. Heredity seems to play a part, and some families have an idiosyncrasy. The symptoms approximate to those of blackwater fever closely, they are anæmia, jaundice, and hæmoglobinuria with granular casts. Skin tests are positive to extracts of the bean, and upon these mainly the allergic basis has been founded. Death usually takes place from extreme anæmia. Epinephrin and blood transfusions are indicated in treatment.

In India an allied species—Vicia sativa—has been shown to contain the alkaloids vicine and divicine

P Robinson<sup>1</sup> has found 3 cases in children in Palestine The symptoms and course of the illness at first resembled those of Lederer's anæmia Then the skin became pale grey, the eyes onset was sudden with vomiting sunken and dull, and consciousness clouded The urine was brown or red Examination of the blood revealed a severe anamia Recovery was startling In March, 1940, these three children once more came under in its suddenness observation suffering from the same disease. This disposition to relapse. together with pronounced eosinophilia in the blood and bone-marrow, led the author to suspect favism, especially when it was discovered that in all three on both occasions the illness had commenced one to two days after eating broad beans. Subsequently, a fatal case was observed in a boy of 1½ years who died in uramic coma after eating uncooked beans. It is suggested that fayism is much commoner than is supposed, and that some patients suspected of blackwater fever may in reality be subjects of favism

M Brulé and M Pestel<sup>2</sup> have recorded 2 cases in France in a brother and sister aged respectively 18 and 15 Both were suddenly attacked by jaundice and passing of black water. The elder died within five days with anuria and azotæmia, but the younger recovered

J-T Eads and R. M Kash<sup>8</sup> have found favism in America—in a case of sudden onset with blackwater-like symptoms which were definitely associated with *Vicia faba* 

REFERENCES — Amer J Dis Child 1941, 62, 701, Pr méd 1943, 51, 241, Nav med Bull Wash 1943, 41, 1720

FIBROSITIS. (See Chronic 'Rheumatic' Disorders)

Sir Philip Manson-Bahr, CMG, DSO, MD, FRCP FILARIASIS The return of marines of the United States Navy from Samoa and the South Pacific has afforded an unprecedented opportunity for the study of Wuchereria bancroft filariasis and of the life-span of the filaria in the body R A Burhans, J D Camp, H R Butt, and R W Cragg1 have issued a report on 46 such men who were diagnosed as suffering from lymphangitis, though no parasites had been Such filariasis is rare in Europeans and had not hitherto been reported in naval personnel stationed in the South Pacific. The interval between the time of possible exposure to infection and the onset of symptoms varied from 3 to 211 months All developed symptoms in the four months September to December Most of the men had worked inland in the jungle Symptoms and signs appeared the same in the original attack as in recurrences In order of frequency the parts commonly involved were. spermatic cord, epididymis, and testicle, the arm, more frequently the forearm; the thigh and popliteal space, the upper eyelid, and the scrotal sac The onset usually occurred at night The patient would be awakened by a sharp pain in the region involved. Fever was rare or mild and of short duration, with localization of symptoms When scrotal contents were involved the first complaint was of soreness of one testis, rarely both This was followed by swelling and often by "lumps" or enlarged glands in the groin The soreness subsided in three to four days leaving a local induration of the spermatic cord or testicle In the arm or leg, in some cases, lymph-glands were swollen, with reddish streaks in the skin At other times diffuse thickenings of the subcutaneous tissues were noted, and wheals, followed by itching, appeared and disappeared within a few hours. None of the men had anything resembling elephantiasis, but many had swellings of the spermatic cord, epididymis, leg, or arm, and nearly all had adenopathy.

Recurrence of pain and swelling ensued after physical exercise These were marked by eosinophilia, but no microfilariæ were ever found From one patient, who was transferred to another hospital, an adult female filaria was removed by biopsy from a lymph-channel near the wrist

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Sulphonamides had apparently no effect in treatment, but X-ray therapy caused prompt decrease in the size of enlarged lymph-glands in the following manner 140 kv, 15 ma, 50 cm tube-screen distance, filtration through aluminium 1 mm and copper \( \frac{1}{4} \) mm, doses of 105 r units every other day, giving a total of 315 r units to each area

E C Faust<sup>2</sup> has supplied some further interesting details. The acute stage has not usually been accompanied by fever. The sites of acute lymphadenopathy have developed in the subcutaneous tissues and were fugitive in character. [This is interesting, as this apparently novel feature was described by the reviewer<sup>3</sup> in Fiji many years ago in natives and Europeans.] There was a tendency towards progressive involvement of the spermatic duct Since only three to six months had elapsed following exposure, the worms were still immature. In one of these patients only have adult worms been recovered, with microfilariæ in the immediate vicinity of their location, but no embryos have been discovered in the circulating blood. These findings are consistent with the conception that it takes approximately one to one and a half years to complete the biological incubation period in the human body.

REFERENCES,—<sup>1</sup>Nav med Bull, Wash 1944, 42, 336, \*Tropical Diseases, 3rd Series of Sommer Memorial Lectures, 1944, 49, \*Filariasis and Elephantiasis in Fig., Report to London School of Tropical Medicine, 1912, 58

FINGERS, GREASE-GUN INJURIES OF. Lambert Rogers, M Sc, F R C S

The grease gun is a dangerous weapon if directed at the operator's fingers or hand F H Smith1 reported the case of a mechanic who accidentally injected grease at 700 lb pressure into the base of the left index finger. The finger became gangrenous and was disarticulated on the ninth day after the miury Forty-five cc of grease were afterwards squeezed out of the wrist and palm Further cases have been reported by R Brooke and G Rooke<sup>2</sup> and by M Mason and F B Queen.<sup>3</sup> Local damage was done, but without loss of digits as in F H Smith's case The latest report comes from Boston in a paper by J J Byrne4 whose patient when greasing a truck accidentally injected his left ring finger (Figs 20, 21). Immediately numbress and swelling resulted, and later the finger began to throb A small incision was made near the entry point of the grease and some of it pressed out Later the palm of the hand and the remaining fingers swelled Warm packs were applied locally, the patient kept in bed, and given codeine On the ninth day the incision was exuding purulent material and the distal half of the finger was blue-black Improvement gradually took place, and although at one time it appeared as if amputation might be necessary, good recovery slowly followed At the end of two months he was able to return to work

Similar injuries have been reported by C E Rice, J E. Hughes, and others in mechanics repairing Diesel engines. In these engines fuel oil is injected at high pressure through fine nozzles into the firing chambers. It is not necessary for either the Diesel nozzle or that of a grease-gun to actually penetrate the skin the injury has occurred in the case of a grease gun at a distance of 8 in from the finger. Tumours containing grease (oleomas) have occurred as late stages of some of the reported cases

Treatment.—Byrne advocates propaganda warning users of grease guns of the dangers of injury Once an injury has occurred he recommends

expectant and conservative treatment in the form of rest in bed, sedation, and dressings at room temperature. It is doubtful whether incisions are of any value in liberating the grease, as it is so widely dispersed, and he advises surgery only for the removal of sloughing tissue or opening abscesses, if and when these develop. Early amputation is to be avoided, as the recovery

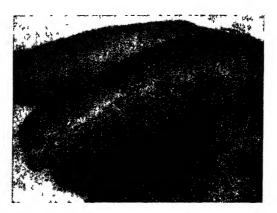


Fig 20—Appearance of left fourth finger six days after injury, showing the blueblack discoloration in the distal half—The small wound on which there is a small drop of serum was made in an attempt to remove some of the grease—The other wound is the original site of injury



Fig 21—Appearance of finger six weeks after injury, showing the small pits through which some of the grease was extruded

(Figs 20, 21 reproduced from the 'Journal of the American Medical Association'.)

of a blackened, useless-looking digit may be remarkable General anæsthesia should be used if operation is undertaken. If subcutaneous oleomas develop they are best removed

REFERENCES — Amer med Ann. 1939, 112, 907, Brit med J. 1989, 2, 1186, Quart. Bull. Northwest Univ med School, 1941, 15, 122, J Amer med. Ass 1944, 125 405, Ibid 1987, 109, 866, Ibid 1941, 116, 2848

FLUOROSIS.

Ralph M F Picken, MB, ChB, BSc, DPH

Relationship of Dental Caries to the Fluorine Content of Drinking Water .-Following upon the recent work on caries and mottled enamel of teeth and their relation to the amount of fluorine in water used for drinking, 1 R Weaver 2 has made a survey of the dental state of children in North and South Shields These towns are separated from each other only by the width of the River Tyne and otherwise resemble each other socially and economically In North Shields, however, the water-supply contains less than 0 25 ppm of fluorine, whereas in South Shields the proportion is as high as 1 4 p p m In both towns the teeth of 1000 children were examined, 500 being aged 5 years and 500 aged 12 years. Severe mottling was not seen in any case, and no definite mottling was found among deciduous teeth, but some degree of it was present in the permanent teeth of 184 of the 500 older children in South Shields, ranging from 3.6 per cent with definite but slight mottling, to 17 6 per cent very slight, and 5 6 per cent doubtful In North Shields, on the other hand, 18 children only were recorded as having questionable, and 2 others very slight, mottling Measured contrast between the two towns as regards caries was significant by the average number of teeth decayed, missing, or filled per child, the caries index for 5-year-olds was only 39 in South Shields, as compared with 66 in North Shields, and for 12-year-olds 24 as against 43 In other words, there was nearly twice as great a risk of caries in North Shields as in South In a further article, Weavers reveals that the contrast at 14 years of age is less marked, that it is present as between native children and those who have come to South Shields about the age of first molar eruption, and that there is little difference between the caries rate in total groups of women of childbearing age in the two towns, but its incidence is probably delayed by about five years on the average in South Shields He surmises that the influence of the agent in the water, which may be fluorine, is to delay the onset of caries, and that it probably acts during the pre-eruptive period and little at later ages

The Direct Relation between Mottling and Caries of Individual Teeth.—J D King4 has inspected the teeth of children in parts of Essex where the water contains a high proportion of fluorine, in parts of Oxfordshire where it is moderate, and in parts of Suffolk where it is low In Essex 46 (92 per cent) of 50 children aged 12 to 14, on conservative standards, showed some degree of mottling of the enamel, and 32 (64 per cent) had some evidence of caries on careful examination. In Oxfordshire, of 31 children of the same age, 80 (97 per cent) had some evidence of mottling-in this survey a more inclusive classification was used than in Essex—and 26 (84 per cent) had caries In Suffolk only the pre-molars were examined, so that the relation of caries generally to mottling cannot be compared with the results of the more complete investigation in Essex and Oxford King considers that previous impressions that caries is less prevalent in places where the proportion of fluorine in water is high are confirmed by his observations. His main object, however, was to measure the incidence of caries and defective calcification on individual teeth which showed mottling of the enamel Stated briefly, his findings were that there was no negative correlation between mottling of teeth and the presence of caries in them, in fact, there was a relatively high incidence of caries in mottled pre-molar teeth in Essex Neither was hypoplasia negatively associated with mottling, except among the pre-molars of Oxford children Among groups of young children in Essex and Oxford only minor degrees of mottling of deciduous teeth were detected, and there was no obvious negative relationship between this condition and carries in the individual teeth King points out that it is not proven that all opacities of the enamel described as mottling are due to fluorine, and that, in any case, this element may possibly protect teeth from

carses in some other way than by affecting their development and structure. The observations both of Weaver and King throw doubt on the value of the local application of fluorine to teeth for the prevention of caries

Fluorosis in South Africa.—T Ockerse<sup>5</sup> has investigated the occurrence of fluorosis in South Africa, where 805 endemic areas have so far been detected. The fluorine content of water-supplies varies greatly from traces up to 53 p p m. Mottled dental enamel under these conditions of intense exposure is common but by no means constant. It was found in 3067 of 12,873 children examined. The variability may be due to the form of compound containing the fluorine, for Ockerse believes that waters containing calcium fluoride are less damaging than those containing sodium fluoride. Gross degrees of mottling, with staining and pitting of the enamel, are sometimes present. The relationship with caries is striking, the percentage of children with caries being 28 among those with mottling of teeth as compared with 69 per cent where there was no mottling. In these regions osteophytic changes also occur among those who have consumed the waters for many years. Nine such cases have been reported in the Pretoria district.

REFERENCES — Med Annu 1944, 117, Brit dent J 1944, 76, 29, Blod. 77, 185, Dent Rec 1944, 64, 102, Union of S Africa, Dept of Pub Hith Rep, Endemic Fluorosis in S Africa, 1944

### FRACTURES.

1 1 /

T P McMurray, F R.C S.

Multiple Spontaneous Idiopathic Symmetrical Fractures' (Milkman's Symdrome).—In 1930 and again in 1934 Milkman reported the details of a patient suffering from an extremely rare and hitherto unrecognized condition of skeletal osteopathy, to which he gave the name of 'multiple spontaneous idiopathic symmetrical fractures' In the succeeding 12 years 18 other instances of patients suffering from similar bone changes have been reported, and in the Journal of the American Medical Association a further case is reported by L Edeiken and N G Schneeberg 1 The outstanding symptoms and signs of this unusual condition are pain, disturbance of gait, and radiological appearance of multiple transparent bands or zones, often symmetrically placed, in various portions of the skeleton, these being usually described as fractures, although complete solution of continuity may in fact not be present. As a rule, the patient complains that walking has gradually become more and more difficult, until eventually even the shortest walks are impossible without causing the greatest distress. The patient described by Edeiken and Schneeberg presents a clinical picture almost identical with that described by Milkman in his cases

The patient—a woman of 34 years of age—came to hospital because of her increasing disability and her difficulty in carrying on with her usual household duties She could walk a short distance with a peculiar waddling gait, and found the very greatest difficulty in getting up from the sitting position. Her previous history showed nothing beyond the ordinary childish ailments until she reached the age of 21 years, when—on account of persistent pains in her right thigh—she was unable to walk without sticks for a period of 4 years At that time the radiograph showed considerable pathological changes, including multiple incomplete fractures through the femoral shafts on both sides, thinning of the neck of each femur, and flattening of each femoral head. The condition was then diagnosed as a variant of osteogenesis imperfecta tarda, but no particular form of treatment was undertaken and she was sent home, then as no improvement occurred in her condition she was eventually admitted again to hospital At this time the patient, who was short in stature, complained of tenderness in various bones, but these sites of tenderness did not correspond to the areas of osteoporosis and decalcification which were obvious in the roentgenograms In making a diagnosis of this condition little help can be obtained

PLATE XI

## MILKMAN'S SYNDROME

(L EDEIREN AND N G SCHNEEBERG)

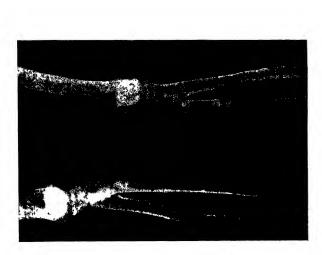


Fig A -Lesions of forearms

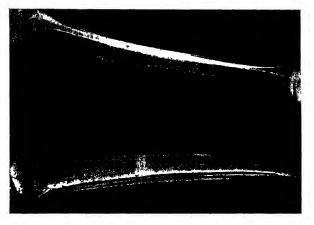


Fig B -Lesion in right tibia

Plates XI, XII reproduced from the 'Journal of the American Medical Association'

### PLATE XII

# MILKMAN'S SYNDROME—continued

(L EDEIKEN AND N G SCHNEEBERG)

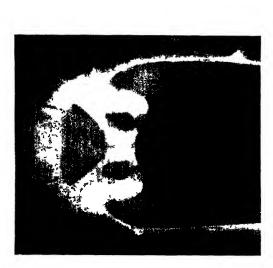


Fig. C -I esions in femurs (note heart shaped pelvis)



'Fig D-Metatarsal lesions

### PLATE XIII

### TOBRUK PLASTER FOR FRACTURED FEMUR (St J D BUNTON)

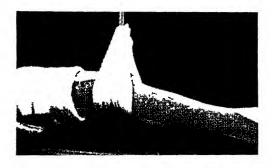


Fig. A —Extension bands and suspension bandage for knee (Padding around ankle is not shown)



Fig. B.—Plaster completed Extension bands with adequate opening above ankle shown



Fig. C.—Cast and limb on Thomas splint. Note split down front of case A pad between great trochanter and the ring and a bandage across the upper end of the leg (to prevent cast rising from splint) are to be added

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from laboratory methods, the blood-calcium may be normal, or elevated, while the phosphorus content of the blood may be low, normal, or even increased. Two of the patients reported in the series have shown traces of glycosuma

Diagnosis.—The diagnosis criteria have been summarized by J Leedham-Green and Campbell Golding<sup>2</sup> and are listed as follows · (1) Pains in lower lumbar region, (2) Pains in lower extremities, (3) Awkward hesitant 'duck waddle' gait, (4) Difficulty in rising from the sitting position, (5) Physical examination negative with slight focal tenderness in scattered bone areas

Radrographic features (1) Circular areas of apparent calcium deficiency or translucent transverse bands or irregular pseudo-fractures, (2) Lesions usually symmetrical, (3) Little or no callus formation at these sites of fracture before treatment, (4) Osseous deformities noted only at a late stage (Plates XI, XII)

Treatment—Unfortunately treatment directed towards the restoration of bone has, on the whole, been unsatisfactory. The aim of any form of treatment must be the recalcification of the osseous lesions. Milkman found that the administration of phosphorized cod-liver oil, visterol, sunlight, and ultraviolet radiation failed to produce any improvement in his patient. The treatment given by Edeiken and Schneeberg on which their patient showed some clinical improvement was a regimen of oral vitamin D (50,000 units daily), with calcium lactate, ultra-violet irradiation of the body, and diathermy applied to the tender areas. Following this line of treatment, they report that the patient was then able to walk for short distances and complained of less pain and discomfort, although the radiographic appearances had remained unchanged for several weeks. After 25 weeks of this treatment the patient gained 19 lb in weight, felt much better, and the radiographic appearances were entirely changed, showing good calcification at the bony lesions and without sign of any recent fractures.

The importance of this disease is to be found in its railty and the difficulty of confirming the diagnosis, even when its presence is suspected. Apart from the radiographic appearances and the localized areas of tenderness there would appear to be no definite signs on which a diagnosis can be made. It would appear also that the line of treatment carried out by the authors is the most effective yet described, and should be persisted in until signs of improvement can be observed.

Splinting of the Femur Fractured by Gunshot Wound: the Tobruk and Double-cuff Plasters.—At the end of the war of 1914-1918 the outstanding advantages of the Thomas splint in the treatment of fractures of the femur were universally accepted The reduction of the death-rate which followed its use had become the greatest argument for its universal employment. It was generally agreed that in no other way could a fractured femur be so easily and successfully treated, and by no other method could a patient suffering from a fracture of the femur be so adequately immobilized during transportation. At the outbreak of the present war it was naturally considered that the problem of transportation of the patient and fixation of the fractured femur had been solved, and the method of fixation in a Thomas splint was employed almost universally During the fighting in the Egyptian Desert considerable difficulty was experienced in transporting patients suffering from fracture of the femur, especially when it was compound, over the very long distances necessary for their removal to the Base, as the roads were extremely rough, and more particularly because adequate attention could not be given to the patient nor to the splint during the journey The surgery of the Forward Area was carried out in and around Tobruk, and patients, who had received

primary treatment there, did not arrive at the Base Hospital for an average of 10 days in 1941, and for at least 5-7 days during the early part of 1942

The problem was two-fold, patients suffering from fracture of the femur splinted by the ordinary routine method complained that during their removal to the Base Hospital they were very uncomfortable and suffered a great amount of pain. In addition, the surgeons found that during the journey many of the fractures had become displaced, and they were anxious to employ the plaster-of-Paris technique to immobilize the extensive wounds in the manner which had proved itself in other grossly injuried tissues. The objections to the use of a hip spica in the treatment of these fractures were many, few patients reached the Base in comfort, while many plaster sores developed over the buttocks, over the dorsum of the feet, and on the posterior aspect of the heels Furthermore, the spica seldom efficiently immobilized a fractured femur during a journey, and rarely controlled a fracture of the upper one-third during the first few days. Hence, by the early days of 1942 other methods of fixation were being tried in this area, and of two methods that were devised that generally known as the Tobruk plaster was at first in general use

St J D. Buxton<sup>8</sup> has described the comparatively simple method of application of these two plasters. In using the Tobruk plaster, after excision and débridement of the wound, where this is necessary, two portions of strapping for skin extension are applied to the lateral aspects of the leg and thigh, extending up to the level of the wound, or to the site of the fracture While these extension straps are steadily pulled the whole limb is enclosed in a plaster case, first the leg and foot are encased, turns of the plaster being so arranged that the extension bands come freely and loosely through the plaster case just above the malleoler, whilst the foot is fixed at right angles in the plaster case The thigh is then similarly supported by a complete plaster envelope, great care being taken to prevent roughening or ridges on the inner side of the cast When the plaster is set the whole limb in the cast is then slung on transverse canvas supports between the lateral bars of a Thomas splint, the ring of which is adjusted so that the counter-pressure is borne directly on the tuber ischii The cast is then split from end to end down the anterior portion of the limb, a rubber or metal band previously incorporated at this site being of considerable help in this part of the procedure A large pad of felt or firmly rolled cotton is then placed between the outer aspect of the ring and the great trochanter in order to maintain the correct apposition of the postero-internal portion of the ring to the ischial tuberosity (Plate XIII)

By using this modification of the standard method of treatment it was found that the long journey of 7–10 days from Tobruk to the Base Hospital could be undertaken with greater comfort than was previously possible. The method has the double advantage of providing fixed extension with firm immobilization and complete limb covering. In its use it is essential that the cast should be split, as otherwise vessels may be compressed, even without primary vascular injury, causing gangrene of the foot or toe. The method has certain limitations in its usefulness, it is useful in that it gives increased immobilization during transport, but it is not suggested that it should replace standard methods suitable in static hospitals. It must also be remembered that the prolonged application of the plaster case is not without danger if it is retained beyond the optimum period, which is 5–7 days

The second method, known as the double-cuff plaster, later became more popular with surgeons in the area because of certain advantages which it had over the original Tobruk plaster. One of the main reasons for the popularity of the double-cuff plaster was the comparative simplicity of its application as compared with the more closely fitting Tobruk plaster. Its application

can be completed rapidly; all that is required is a suitable Thomas splint with strapping extensions, as in the Tobruk plaster, plus a foot-piece and 6-in plaster-of Paris bandages. After the extension straps have been applied to the limb, as in the previous method, the extension ends are firmly fixed to the end of the Thomas splint which has been threaded over the limb. Plaster bandages are now used to incorporate the limb and the splint in one firm bundle, protection being previously given by adequate padding of the limb, especially over the bony points and over the front and back of the thigh. The foot-piece is now adjusted so that the foot is maintained throughout treatment at a right angle. If this latter point is not strictly supervised a pressure sore may develop rapidly over the dorsum of the foot, or over the back of the Achilles tendom.

These two methods have been proved and are extremely useful to meet the difficult conditions of transport in the Desert, they are safe so long as their limitations are realized, and their use should not be continued after the patient reaches the Base Area

References —  $^1J$  4mer med Ass 1943, 122, 865,  $^3Brit\ J$  Surg 1937, 25, 77,  $^3Lancet$ , 1943, 2, 564

### GALL-BLADDER AND BILE-DUCTS, SURGERY OF.

A Rendle Short, MD, FRCS.

Congenital Cystic Dilatation of the Common Bile-duct.—This deformity has attracted considerable attention of late years Four out of five of these children are females E H Hutchins and G B Mansdorfer, of Baltimore, describe a case in a girl of six successfully treated A tumour mass could be felt in the right hypochondrium which varied in size and consistency. There were attacks of colicky pain Jaundice is often present, but in this child it was absent. The treatment adopted was, first, drainage of the cystic swelling, and, later, anastomosis of the duct to the duodenum

Pathology of Gall-bladder Disease.—J L Batty and Seymour Gray,<sup>2</sup> of Chicago, publish a report of their investigations, by the colloidal gold test, of hepatic function in patients with proved disease of the gall-bladder A positive reaction, indicating liver damage, was found in 40 out of 100 patients. The highest incidence was in cases with infection and jaundice, and the lowest in those with quiescent gall-bladder disease

Freda K Herbert, of Newcastle-on-Tyne, has been able to demonstrate a prothrombin deficiency in the blood in about two-thirds of a series of patients with obstructive jaundice. Restoration to normal was effected in some of these by the administration of vitamin K in the form of Kapilon (naphthoquinone)

Gall-stone Disease.—By means of a routine palpation of the abdominal viscera during a laparotomy in female subjects for other conditions, E. D. Truesdall, of New York, found unexpected and supposedly asymptomatic stones in the gall-bladder in 50 of 500 cases, that is, 10 per cent. The majority of these women declined a second operation when the presence of stones was made known to them, so they were carefully followed up. Only two continued symptom-free. Twelve returned sooner or later to have their stones removed.

According to K M. Kaikini,<sup>5</sup> of Bombay, gall-stones are rather rare in India, but chronic cholecystitis, usually in men, is very common. They often give a history of dysentery or enteric fever Pain resembling angina pectors is a common complication, and there may be actual degeneration of the heart muscle. He relies on Westphal's syndrome to establish the diagnosis (pain on pressing with the thumb between the right sternomastoid and the scalenus anticus towards the larynx, the pain may radiate downwards).

Cholecystography cannot be depended on to diagnose pathological conditions of the gall-bladder. He removed the gall-bladder in 93 cases. Seven died. The patients were by no means all relieved of their pain , if pain persists it usually disappears on giving belladonna and alkalis, or insulin [It seems doubtful if the diagnosis of cholecystitis in all cases of this series was sufficiently established —A R S ]

Data from Long Island Hospital quoted by F I Dessau<sup>6</sup> go to show that stones increase in frequency as age advances, and that the incidence in males is higher than is usually supposed

and believe of dam blones, available						
AGE	Number of Cases			PERCENTAGE WITH GALL-STONES		
Yr 41-60 61-80 81 and over	Male 271 715 115	Female 107 353 78	Total 378 1068 193	Male 11 4 17 6 27 2	Female 22 4 32 5 46 8	Total 14 6 22 6 35 2
Totals General averages	1101	538	1689	170	23 7	22 2

Incidence of Gall-stones, 1923-1942

R Russell Best, of Nebraska, considers that in 7 per cent of patients with gall-stones, stones are also present within the liver. This accounts for a certain number of recurrences of pain and jaundice. To obviate this he recommends a "biliary flush" for three days before operation, in the hope of washing them down from the intrahepatic into the common bile-duct. He repeats the flush about a week after operation

Three-day Biliary Flush Regimen -

### 1st day ...

- 1 Decholin or procholon-3 tablets 8 times a day and at bedtime
- 2 Nitroglycerin, gr 1-100, 3 times a day before meals
- 8 Magnesium sulphate, 2 drachms before breakfast
- 4 Pure cream, 1 oz before evening meal and at bedtime

### 2nd day ---

- 1 Decholin or procholon—3 tablets 3 times a day and at bedtime
- 2 Atropine, gr 1-100, dissolved in a little water, 3 times a day before meals.
- 3 Magnesium sulphate, 2 drachms before breakfast
- 4 Pure cream, 1 oz before evening meal and at bedtime

### 3rd day -

- 1 Decholin or procholon-3 tablets 3 times a day and at bedtime
- 2 Nitroglycerin, gr 1-100, 3 times a day before meals
- 8 Magnesium sulphate, 2 drachms before breakfast
- 4 Pure cream, 1 oz before evening meal and at bedtime
- J H Saint, of California, emphasizes the importance in cases of acute cholecystitis of watching carefully for palpable enlargement of the gall-bladder. If this can be detected, operation is urgently indicated to avoid the dangers of gangrene and peritoritis. Rising pulse-rate, spreading rigidity, and deteriorization of the general condition, are also signs of danger, but pain and rigidity may diminish, when the wall of the gall-bladder is becoming gangrenous but is wrapped in omental adhesions. This corresponds with the well known phase in appendictis when the pain almost goes just before the appendix perforates.

Perforation of the Gall-bladder.—Twenty-five examples of this disaster, at the Henry Ford Hospital in Detroit, are studied by L. L. Cowley and H. N. Harkins. The mortality was 24 per cent. In 6 cases general peritonitis

followed, in 16, localized abscess, in 3, perforation into a viscus. There was usually a long history of chronic discomfort and a short history of acute pain. Like Saint, they argue not so much for early operation in all cases of acute cholecystitis, as for close watching of every such patient for evidence of obstruction.

Acute Cholecystus.—E L Eliason and L W Stevens, 10 of Philadelphia, argue in favour of really early operation (in a matter of hours) for acute cholecystitis Drainage is often safer than cholecystectomy. If the patient is seriously ill, a local anæsthetic is indicated. The mortality in 92 cases of cholecystostomy was 2 per cent. On 48 occasions the gall-bladder was removed, none died. After-treatment is important, the patient is instructed to breathe deeply, if there is vomiting the stomach is aspirated continuously

Gall-bladder Surgery in Diabetics.—H. E Essele, 11 of St Louis, speaking from an experience of 76 cases, says that the results of surgical treatment are equally good in diabetics and in non-diabetics. The total operative mortality for all cases, including malignant growths, was 3.9 per cent. On the other hand, removing the gall-bladder does not improve the diabetes. Gall-stones are more likely to produce dangerous complications in diabetics than in normal people.

Operative Technique.—Dean Macdonald, 12 of St Catherines, Ontario, advises that in every case where the gall-bladder is removed, a drainage tube should be left in the cystic duct, so that if the progress is unsatisfactory, cholangiography can be done, and solvents injected to dissolve any stone left behind in the common duct

J. Shelton Horsley and G Winston Horsley<sup>13</sup> have a method of performing cholecystenterostomy or choledocho-enterostomy, using a rubber band under tension to cut through the visceral walls and make the anastomosis in an aseptic manner without leakage

Injury to the common duct continues to exercise the ingenuity of surgeons called upon to repair the damage Grey Turner<sup>14</sup> finds the results of repair operations unsatisfactory in the long run Of his series of 10 late repairs, 3 died after operation, and 5 more died, many years afterwards, with recurrent biliary disease None of his cases were permanently successful Immediate repair is usually a success. It is obviously of first-class importance to recognize the injury to the common duct as soon as the damage is done. Sir James Walton<sup>15</sup> writes on the same melancholy subject In some of the victims, the bile is all discharged through the external wound; in others there is intractable jaundice. In the first type the repair operation is difficult but the patient is usually a good risk, in the second type it is the other way about Of the various procedures described-end-to-end repair over a Trubber or vitallium tube, dilatation of the stricture, local plastic operation, choledochoduodenostomy, etc -- Walton says that direct implantation of the duct into the duodenum is the method of choice. Jejunum can be used if the duodenum is not suitable Walton raises a flap of duodenum, sutured round a tube, to bring up to join the cut end of the bile-duct Of his 16 cases, 3 died, but 4 have remained well for periods of 10 years to 4 months Three died of cholangitis years afterwards, and 2 more have had recurrent trouble L R. Dragstedt<sup>16</sup> and colleagues report 2 cases in which they implanted the hepatic duct into the stomach or duodenum over a catheter. One patient did well, the other died

REFERENCES—JJ Amer med Ass 1944, 125, 202, <sup>1</sup>Arch intern Med 1943, 72, 176, <sup>1</sup>New Engl J Med 1943, 229, 265, <sup>4</sup>Ann Surg 1944, 119, 232; <sup>1</sup>Indian J Surg 1944, 6, 5, <sup>4</sup>New Engl J Med 1943, 229, 464, <sup>7</sup>Surg Gynec Obstet 1944, 78, 425, <sup>4</sup>Ibid 1948, 77, 250, <sup>4</sup>Ibid 661, <sup>10</sup>Ibid 1944, 78, 95, <sup>11</sup>Ann Surg 1943, 118, 107, <sup>13</sup>Ibid 97, <sup>13</sup>Ibid 558, <sup>14</sup>Lancet, 1944, 1 621, <sup>14</sup>Surg Gynec Obstet 1944, 79, 57, <sup>14</sup>Ibid 1943, 77, 126

### GAS CANGRENE.

Lambert Rogers, M Sc, F R C S

A recent tendency to use the term clostridial myositis is noticeable, the reason being to distinguish true gas infection of muscle from anaerobic cellulitis, for which, it is to be feared, needless amputations have in some cases been performed in the mistaken belief that the condition was the fulminant necrotizing infection of muscles There has fortunately been a very low incidence of gas gangrene among the wounded of the present war when compared with the war of 1914-1918 Major J D MacLennan<sup>1</sup> has reported on the condition of the Tripolitania wounded When the fighting moved from the Western Desert to the more cultivated areas of Tripolitania and Tunisia. the incidence of gas gangrene rose from 8 4 per 1000 to 6 or 7 per 1000 of the Twenty-eight of 44 cases had had a major arterial injury and in wounded 2 there had been long-continued application of a tourniquet The incubation period of this group of cases was found to be from 5 hours to 29 days, but if the exceptionally long instance is excluded the average is 16 days essential clinical features were pain, swelling, cedema, and rapidly increasing The importance of pain is emphasized in a War Office Memor-Indeed it is "Pain is the most consistent and helpful symptom andum<sup>2</sup> not too much to say that the sudden and unexplained onset of pain in a war wound ought always to suggest the possibility of gas gangrene " Of the 44 cases reported by MacLennan, 13 died

Treatment.—The value of antitoxin has been emphasized in recent papers It must be administered early, repeatedly, and in adequate amounts, intravenously or intramuscularly So long as toxemia persists antitoxin therapy MacLennan finds that adequate surgical procedures, chemotherapy, and intensive serotherapy, with appropriate measures of resuscitation, are better than more drastic operative measures M G MacFarlane<sup>8</sup> has examined the results of the treatment of 139 cases of established gas gangrene in which there was a marked degree of toxemia The fatality-rate was significantly lower among those who received antitoxin The combined use of surgery and antitoxin was more effective than that of surgery alone, and he concludes that treatment demands the early and continued use of surgery, effective chemotherapy, and antitoxins. It is probable that antitoxin and the sulphonamides potentiate each other's activity Pencellin used prophylactically, locally and parenterally, in wounded and injured flying personnel, did not prevent the development of gas gangrene, and Colonel Elliot C Cutler and Major W R Sandusky,4 who make this report, believe we have not observed a sufficient number of cases as yet to say in what way penicillin may modify the infection Reporting its use in cases of gas gangrene treated in Italy, Lt -Colonel J S Jeffrey and Major Scott Thomson<sup>5</sup> believe it has a definite place alongside surgery and antiserum

X-ray Therapy.—The value of X-ray treatment is still disputed Experimentally W H Erb and P. J Hodes, of Philadelphia, found that irradiation had no demonstrable effect on Clostridium welchii infection in the pigeon, and that serum alone was of value in saving the lives of the majority of the birds. J Turner, and R K Scott, of Melbourne, however, report encouraging results in the treatment of civilian patients, and R E Strain, writing in the Indian Medical Gazette, believes that X rays have proved of definite value. He states that an ordinary diagnostic or portable unit may be used, and that such a unit has been adopted by the United States Army for this purpose [Most of those who advocate X-ray therapy believe that it reduces the necessity for amputation, but in any case as the result of modern methods of treatment without irradiation, amputation is less often called for to-day. The value of X rays would appear to remain undecided or at least unproven—L C R ]

**Prophylaxis.**—The question of active immunization by means of concentrated toxoids has been studied in experimental animals by M. Robertson and J. Keppie,  $^{10}$  who report favourably, and G. B. Reed and J. H. Orr,  $^{11}$  of Kingston, Ontario, point out that already C. welchi toxoid is available, or could readily be made available, in quantity, and it has been suggested that it might be used in the Army as a prophylactic measure. They believe that if and when C septicum and C novy toxoids become available they can be combined with that of C welchi, and all three toxoids with TAB vaccine.

REFERENCES — Lancet, 1944, 1, 203, \*Army med Dept Bull Supp 15, 1944, May, \*Brit med J 1943, 2, 636, \*Brit J Surg 1944, 32, 168, \*Ibid 159, \*Ann Surg 1943, 116, 713, 'Roy med Hosp Chin Rep 1942, 13, 91, \*Ibid 41, \*Indian med. Gaz 1943, 78, 275, \*Dlancel, 1943, 2, 811, \*Lamer J med Sc. 1943, 206, 379

GASTRIC (See also STOMACH)

GASTRIC AND DUODENAL ULCER: MEDICAL ASPECT. (See also Dyspepsia and Peptic Ulcer in the Services)

Sir Henry Tidy, MD, FRCP

- M H Pappworth and J. F. Loutit¹ (London) record observations on 30 cases of gastro-duodenal hæmorrhage Of these, 11 were mild or moderate and 19 severe There was only one death, which occurred in a woman, aged 71, in whom autopsy showed no definite lesion in the stomach or duodenum The authors consider the various indications which have been given for transfusion and decide that it is best to diagnose shock on the clinical picture Blood transfusion was used freely in various forms with uniformly good results Although the subtitle of this communication is "Treated Medically with Enthusiastic Blood Transfusion", the methods do not appear to differ from those now in general use
- J E Berk, M E Rehfuss, and J Earl Thomas<sup>2</sup> (Philadelphia) have investigated the effects of the administration of antacids on the acidity in the duodenal They employed a specially constructed double-lumen tube, by which it was possible to observe simultaneously the effect of antacid and the reaction both in the pyloric antrum and in the duodenal bulb in patients with chronic The antacids used were aluminium hydroxide gel and Sippy duodenal ulcer powder It was found to be possible to neutralize the acid in the stomach for a short period of a few minutes and to reduce it considerably over a period of 40 minutes, but in the duodenal bulb the acid was never completely absent Sippy powder was more effective than aluminium hydroxide gel, but the reduction in duodenal acidity was followed by a secondary rise after 50 minutes, although this phenomenon was not observed in the stomach average curves for the stomach and duodenum bore a rough resemblance to each other for the first 40 minutes, in the subsequent half-hour the curves were distinctly of different pattern. These results are considered to show that observations of gastric behaviour after antacids cannot be accepted as accurate indexes of corresponding effect on acidity in the first part of the duodenum The authors discussed the cause of the beneficial action of antacids in the treatment of patients with duodenal ulcer They are unwilling to attribute it to the reduction of acidity
- S Wolf and H G Wolff<sup>3</sup> (New York) have continued their investigations on the so-called 'new Alexis St Martin', an individual with a permanent gastric fistula performed for a beingn stricture of the esophagus 40 years previously. They have noted the relation between changes in the gastric physiology and changes in the gastric secretion. In the fasting stomach they found that the phase of active contraction was accompanied by heightened vascularity of the mucosa and an increased rate of production of acid. After the subcutaneous

injection of histamine or the intra-gastric administration of alcohol or beef bouillon, there was invariably an increase of vascularity and acid secretion. While active contraction did not occur unless the mucosa was red, intensified hyperæmia and high acid output were not always associated with increase in gastric motility.

H J Tumen and M M Lieberthal made gastroscopic studies of 50 patients with duodenal ulcer uncomplicated by pyloric obstruction Of these, 33 had chronic gastritis, I had unclassifiable inflammatory changes, and 16 had normal stomachs, 6 of the 16 patients with no evidence of gastritis had an atypical history or poor response to treatment, or both, 21 of the 33 patients with gastritis had an atypical history or poor response to treatment, or both the incidence of atypical history and poor treatment response was somewhat greater in ulcer patients who had gastritis than in those who had not, it is difficult to ascribe much significance to this, because among the 21 patients with gastritis who were examined by gastroscope more than once, the clinical severity of the symptoms seemed related to the gastroscopic picture in only 10 In the remaining 11 there was no correlation between the gastroscopic picture and the presence or character of symptoms The presence of gastritis did not regularly influence the clinical course of duodenal ulcer 
It was impossible to postulate the presence or absence of associated gastritis on the basis of the nature of the symptoms or the character of the response to treatment [This careful study further illustrates the difficulty of interpreting the meaning of gastritis It is striking that an associated gastritis does not appear to influence either the symptoms or the response to treatment of a duodenal ulcer -H T]

A J Nedzel<sup>5</sup> has studied the experimental production of gastric ulcers in dogs by injection of pitressin He injected intravenously 20 pressor units of pitressin for every 5 kilo of body-weight These observations point to changes in the blood-vessels as the cause of the resulting ulcer formation, since pitressin injected intravenously provokes a spasm of the small blood-vessels as well as a spasm of the muscular tissues which in their turn add to the compression of the The contraction is later followed by dilatation of the same blood-vessels A normal rhythm of this type keeps the vascular supply and demand in constant equilibrium, but the same contraction, if prolonged or exaggerated, injures the parenchymal cell With the exaggerated pressor phase as it occurs under certain natural conditions of life, e.g., with cold or after injections of pitressin, contractions of the blood-vessels occur which may reach such a degree that a vessel may rupture and establish a hæmorrhage into the stomach Erosions, ædema of the stomach wall, and necrosis of the mucosa may be observed, ultimately leading to typical ulcer formation Animals which have been fatigued and are more acid evince greater difficulty in adjustment to meteorological changes, and in them superimposed pressor effects from injections of pitressin apparently lead more readily to prolonged spasms and to delayed recovery from the effect of spasms This is consistent with the seasonal prevalence of ulcer formation [In connexion with these experiments may be borne in mind the observations of Mann and Williamson that the use of extract from the urine of pregnant and of normal women produced definite healing of experimental ulcers in dogs and distinct symptomatic improvement in patients with duodenal ulcer without any decrease in the gastric acidity -H T]

Henry Tidys (St Thomas's Hospital) has traced the course of the deathrate from peptic ulcer in Great Britain between 1912 and 1938. The data are taken from the Annual Reviews of the Registrar-General for England and Wales and for Scotland, and the Annual Report of the London County Council The trend has been followed separately for London, Rural Districts of England, England as a whole, and Scotland. Peptic ulcer has been subdivided for the sexes, for gastric and duodenal ulcer, and for the age-groups 20-40 and 40 years and over, and the death-rate calculated per million living in the age-groups, sex-groups, and areas concerned in the various years. It would appear

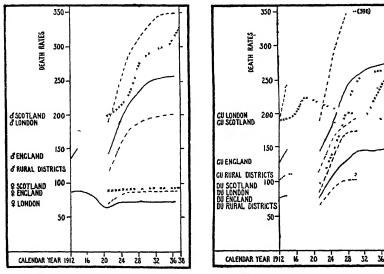


Fig 22—Peptic ulcer Population over 20 years of age Crude death-rates per million living

Fig 23—Gastric and duodenal ulcer Males over 40 years of age Crude deathrates per million living

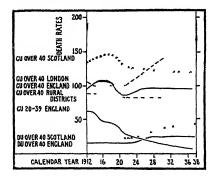


Fig 24—Gastric ulcer and duodenal ulcer in females Crude death-rates per million living

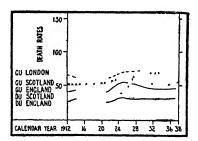


Fig 25 —Gastric ulcer and duodenal ulcer Males between 20 and 39 years Crude death-rates per million living.

(Figs 22-25 by kind permission of the 'British Medical Journal')

that a rapid rise in the rate occurred sometime between 1920 and 1980, and that subsequently the rates were maintained, but without further rise. The rise has been due almost entirely to males over 40 years of age. There are geographical differences, since in London the rise has particularly involved gastric ulcer and in Scotland duodenal ulcer. There has been little rise under

40 years of age, and in females of any age A striking fall has taken place in the previously common group of gastric ulcer in women under 40. The trends of the death-rate are shown in Figs 22, 23, 24, and 25. The following is a general summary of the trends —

Calendar Periods—(a) Between 1912 and 1920 there was little or no rise in rates for peptic ulcer, or for the various groups where returns are available, (b) Between 1921 and 1930 there was a rapid rise in many groups, (c) Between 1930 and 1938 there was little or no further rise The maximum rise was between 1921 and 1925, the rate of increase diminishing after 1925 to 1928 or 1930 The only definite exception to the above is G U in males over 40 in Scotland

Absence of Falls after Rises —Rates which rose were subsequently maintained at the maximum level

Age-Incidence —Rises are almost confined to age-groups over 40 years Age-groups under 40 years show little change between 1912 and 1938

Sex-incidence—(a) The rates for females both over and under 40 have shown little or no tendency to rise between 1912 and 1938, (b) GU in females under 40 has fallen to a very low rate, in continuation of a decrease which began in previous decades. The ratio males to females has consequently been rising rapidly

The rise in rates for peptic ulcer for the population over 20 years has thus been due almost entirely to males over 40

Gastric and Duodenal Ulcer —The death-rate for G U throughout the period is considerably in excess of that for D U for both sexes and age-groups and all areas, except for males in Scotland after 1927 Gastric ulcer showed a slow rise up to 1938 in males over 40 in England The rise was rapid in the last few years in Scotland For duodenal ulcer the rate became practically stationary in all age- and sex-groups and all areas after 1930

Areas —Death-rates for peptic ulcer are highest in London, slightly lower for Scotland, lower for England, and lowest for Rural Districts of England These differences are mainly due to rates for males over 40 Differences are slight for males under 40 and for females, in which groups rates are low Scotland The trend of the rates for G U in males over 40 is entirely different from those for England and constituent areas of England For D U in males over 40 the rise was extremely rapid between 1921 and 1931 Rural Districts The rates for males over 20 are approximately 60 per cent of those for London and Scotland and 80 per cent of those for England

REFERENCES — Lancet 1943, 2, 469, 2 irch intern Med 1943, 72, 46, 3Brit med J 1943, 2, 397, 4Gastroenterology, 1943, 1, 555, 6 I mer med 188 1943 123, 439, 4Brit med J 1944, 1, 677

### GASTRIC AND DUODENAL ULCER: SURGICAL ASPECT.

A Rendle Short, M.D. FRCS

Gastric Secretion.—B P Babkin and M Schachter, writing from the Physiological Department of McGill University, point out that to control hyperacidity either an extensive removal of the acid-secreting gland area must be undertaken (subtotal gastrectomy), or the nervous factor in promoting the flow of gastric juice and also the chemical factor derived from the pars pylorica and from the duodenal mucosa must both be checked. Division of both vagicuts out the nervous factor, but in animals this operation greatly impairs the health. Division of one vagus reduces gastric secretion, but only for a few weeks, after which it returns to normal Partial gastrectomy eliminates the chemical factor only partially, by removing the pars pylorica, an extensive duodenectomy would be needed to eliminate it altogether. They deduce that either subtotal gastrectomy, or partial gastrectomy with section of the left vagus, is the operation of choice for duodenal ulcer with high acidity

G J Heuer and C. Holman,<sup>2</sup> of New York, find that clinical cure and reduction of acidity by no means always walk together. Of 163 cases treated by gastrojejunostomy or gastric resection, 61 patients had achlorhydria or low acidity, and 102 had normal or high acidity, but 136 had satisfactory clinical results. Those treated by gastro-enterostomy had little or no reduction in acidity, but 75 per cent remained well for many years. The reduction in acidity after resection depended on the area of the stomach removed. Evidently there is another factor besides reduction of acid secretion, perhaps dilution and neutralization, concerned in the healing of the ulcer. Very large resections would therefore seem not to be indicated.

Treatment of Gastric and Duodenal Ulcer.—There is an essential difference in the outlook in gastric and duodenal ulcer, because cancer in the stomach is common, and in the duodenum rare E S Judd and J T Priestley, of the Mayo Clinic, find that there is an error in the pre-operative diagnosis between gastric ulcer and cancer of approximately 10 per cent. Only half-the patients treated by medical means for ulcer have an entirely satisfactory result, whereas the great majority of those operated on are cured. The mortality in their clinic is 2.5 per cent.

Captain Waltman Walters and Lieutenant H. R Butt, seconded from the Mayo Clinic to the United States Navy, put in a plea for more frequent and earlier operation for officers and men with peptic ulcer, with a view to returning them to duty Medical treatment of such patients seldom fits them to resume sea-going service. Only a very few cases treated successfully by operation are mentioned, and the problem still awaits solution.

Operations on the Stomach.—It is possible to estimate the amount of blood lost in gastric operations by collecting all the swabs or packs, washing the blood out of them by repeated (ten times) soaking in tap water and taking an estimation of the hæmoglobin in a sample of the whole by means of a photoelectric colorimeter. The average loss at a subtotal gastrectomy was 234 c c. This may be compared with amputation at the hip, 300 c.c., splenectomy, 160 c.c., radical mastectomy, 600 c.c. (Oppenheim and colleagues, New York.)

- F H Lahey, of Boston, describes "a simple, useful anterior gastro-enterostomy". Posterior gastro-enterostomy is difficult and unsatisfactory when the mesocolon is short and fat, and if a gastrojejunal ulcer unfortunately follows in such a patient, the necessary partial gastrectomy can be very difficult. An anterior anastomosis is under these circumstances the best method, and to make it, the great omentum should be detached from the greater curvature of the stomach and from the colon, and a loop of jejunum anastomosed to the curvature, that is to say, to the lowest portion of the stomach (Fig. 26)
- F G Connell' speaks well of partial fundusectomy (proximal gastrectomy) as a treatment for intractable, non-obstructing duodenal ulcer Late follow-ups, up to ten years or more, show that the results were always satisfactory (20 cases)
- W de W Andrus<sup>8</sup> and colleagues break new ground in the treatment of duodenal ulcer, by grafting a pedicled flap of jejunum into the wall of the stomach. This operation, in animals, markedly reduced gastric acidity. A gastro-enterostomy is not helpful. A portion of jejunum is excised, but left attached to its mesentery, the gap in the jejunum is then closed. The posterior wall of the stomach is brought through the transverse mesocolon, and an area excised corresponding in size to the segment of jejunal flap, now opened out by cutting along its antimesenteric border. The graft is then sewn into the stomach. Four successful cases are described. [The communication is interesting, but, obviously, far more experience is necessary before any opinion can be expressed.—A R S ]

Gastrojejunal Ulcer.—L Sipos<sup>9</sup> believes that this complication can largely be prevented by correct technique. A small anastomotic opening is best, that allows the stomach to complete its digestion and exhaust the effect of the gastric juices. Bruising of the cut edges must be avoided

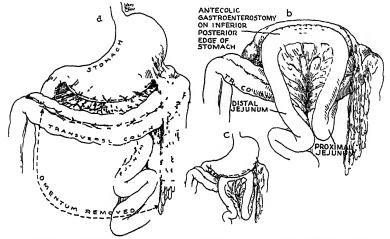


Fig 26—a, The omentum is removed well over on to the left side of the greater curvature. The greater curvature is completely free and is easily lifted up b, The greater curvature of the stomach is held up in a Babcock clamp (not shown), and the genum is attached to it just behind the greater curvature edge in this position the gastric contents gravitate back into the stomach, and the edge of the stomach freed of its omental attachments can be lifted well up into vision and the anastomous can be done without clamps or tension. With this mobilization there is no limitation as to the size of the stoma c. The stomach is in position and the stoma is completed. Note the absence of any iguinojejunal anastomosis between the efferent and afferent loop in this procedure. (Reproduced from 'Surgery, Gynecology, and Obstetrics')

S. Mage, 10 of New York, points out that recurrent ulcer may develop as late as thirty years after the primary operation. Of his 41 cases, 40 followed duodenal ulcer and only 1 gastric ulcer. He has not observed a case of recurrent ulcer when a partial gastrectomy has obtained complete achlorhydria. Removal of a duodenal ulcer along with the partial gastrectomy by no means always prevented the later development of a gastrojejunal ulcer.

#### PERFORATION OF GASTRIC AND DUODENAL ULCER

Relation of Perforation to War Conditions.—We recently noticed some very interesting observations by medical students in London and Bristol, to the effect that 'blitz' periods coincided with a marked increase in the number of perforated ulcers seen C G Spicer, D N Stewart, and D M. de R Winser<sup>11</sup> have extended these investigations, to show that during the whole raid period, September, 1940, to May, 1941, the perforations treated at sixteen London hospitals averaged 35 per month, whereas during the three pre-war years it was 22 7 per month, and in the post-blitz period 18-4 per month. It is interesting to note the same effect of war conditions in Austria. A Slany<sup>12</sup> reports 3 or 4 cases per month at Wiener Neustadt after the outbreak of war, compared with 1 or 2 a month in peace-time. [It would be interesting to know the figures for German towns in 1944—A R S

Treatment.—Stanley Raw<sup>13</sup> writes of 312 cases treated at Newcastle-on-Tyne, with a mortality-rate of only 14 4 per cent He was fortunate to receive 249 of his patients within 12 hours hours of perforation. The death-rate was only 65 per cent when the operation was within six hours. He contented himself with simple closure of the perforation, without drainage, except in late cases.

A Strauss, <sup>14</sup> of Cleveland, has been experimenting with primary gastric resection for perforation, in the younger patients, following the advice so earnestly given by Yudin, of Moscow Of his last 12 cases of perforation, 8 were resected and all did well, 4 were sutured and 3 died. [Obviously, the good risks were resected, and the bad risks sutured The series is very small—ARS]

End-results —Of 103 naval officers and ratings operated on for perforated ulcer at Haslar between 1924 and 1934, 44 per cent were found by C P G Wakeley<sup>15</sup> to be still serving in the Navy Only 8 per cent died. The deduction is that it is not necessary to discharge all these men from the Service as a routine

A C Williams, 16 of Boston, found in a follow-up, three years later, that the result was excellent in 28 per cent, good in 27, poor or only fair in 22 per cent, poor in 23 per cent. Three patients perforated again. In nearly all the treatment had been simple suture

W L Estes and B A. Bennett<sup>17</sup> report on 80 cases, with an operation mortality of 8.7 per cent. This low figure they attribute to early operation, simple closure of the perforation, spinal anæsthesia, intravenous saline and glucose, post-operative gastric suction, and sulphonamides. A follow-up showed Completely cured, 5.6 per cent. Needing medical treatment, 71.7 per cent. Needing further surgery, or hospital attention, 22.8 per cent. Re-perforation, 17.7 per cent. They do not agree with the common opinion, that perforation seems to do an ulcer good.

#### GONORRHŒA.

T Anwyl-Davies, MD, FRCP

The preliminary reports in last year's Medical Annual that penicillin is a most potent agent against gonorrhea have been confirmed by many workers. This chemotherapeutic agent causes the prompt disappearance of inflammatory reaction simultaneously with the death of the gonococcus, and may be used alone or in combination with the sulphonamides

Diagnosis.—The results of sulphonamide in 926 cases of gonorrhoea are presented by R A Koch, E. N. Mathis, and J C Geiger¹ (San Francisco), who were perturbed at the repeated occurrence of positive gonococcal cultures in individuals who had become promptly asymptomatic on treatment and had remained so for long periods, they therefore reviewed all their cases and found that diligent search for gonococci over a prolonged period (3 months) will reveal their presence in 30 per cent of clinically asymptomatic sulphonamide-treated patients. To reduce the percentage of error in detecting the gonococcus, after many comparative tests had been made, the reviewer, with the aid of G P Goffi, has adopted the following routine both for diagnosis and test of cure in the V D. Department at St Thomas's Hospital —

Smears—Incorrectly—made films cause many errors The discharge, collected on a sterile swab, is "rolled out" over the surface of a perfectly clean slide by rotating the cotton tip applicator between the finger and thumb. Rolling is superior to rubbing the swab on the slide because a regular thin

smear is obtained, the pus cells remain intact, and more gonococci retain their intracellular position. When the slide has been air-dried, the film is fixed with a minimum of gentle heat and stained by a new procedure in which, apart from other differences to the modified Gram methods in general use, acetone is used instead of alcohol—

- 1 Stain with crystal violet solution for 1 minute
- 2 Wash off the excess of stain with Lugol's iodine and then allow this solution to act for 1 minute
- 3 Drain off excess of iodine, but do not wash or dry, and add pure acetone drop by drop until no colour is seen in the washings (decolorization is very rapid, requiring 10 sec or less, and the time should be reduced to a minimum)
  - 4 Wash slide in distilled water.
- 5 Remove excess of water with filter paper and air-dry thoroughly, as moisture interferes with the counter-stain
- 6 Counter-stain with formol methyl-green-pyronine-G solution (free from methyl violet) for 1 to 2 minutes
  - 7 Wash rapidly in distilled water, blot and dry

Cultures —An egg agar medium containing starch and dextrose is used as it is more satisfactory than the usual hydrocele agar slope with disodium hydrogen phosphate. The material is also put through the four sugars, glucose, sucrose, maltose, and lactose, in a CO<sub>2</sub> atmosphere. These additional tests are important, for, during the first week of routine use, two cases, both diagnosed as gonococcal infections by the usual hydrocele agar cultures and oxidase tests, were found to be infections of (1) N catarrhalis, and (11) N flavus

Pencillin Treatment.—To determine the curative dosage of penicillin, C Ferguson and M Buchholtz<sup>2</sup> (US Marine Hospital) studied 753 seamen with gonorrheal urethritis resistant to amounts of sulphonamide varying from 20 g to 500 g. At first, 5 patients were treated intravenously, but this was abandoned for the intramuscular route. Of the 753 patients, 29 (4 per cent) were failures. From the groups of cases with no failures, 5 to 6 injections of a total of 100,000 units or more seem necessary to effect a cure. In a group of 387 patients with 10 failures, the total dosage was only 80,000 units; 20,000 units for the first dose, 10,000 units for each of the next 4 doses, and finally 20,000 units for the sixth dose. In 42 cases with no failures, 6 injections of 20,000 units were given

Seventy-five men with sulphonamide-resistant gonorrhoea were treated by J F Mahoney, C Ferguson, M Buchholtz, and C J Van Slyke<sup>3</sup> with 10,000 units intramuscularly every 3 hours, night and day for 45 hours 74 responded in a satisfactory manner

- C J Van Slyke, R C Arnold, and M Buchholtz4 consider that one optimal course demands 120,000 units over a 15-hour period. No difference was found in the response to penicillin between untreated patients and those who had failed with sulphonamide.
- J N Robinson<sup>5</sup> (US Army) has reported on 1000 cases of sulphonamide-resistant genorrhoea and 100 cases of untreated acute genorrhoea. The first group received penicillin intramuscularly in 10,000 units every hour or 20,000 units every 3 hours until 100,000 units were reached, 53 which did not respond received a second course (3 required a third course) of between 100,000 and 150,000 units. Previously, 500 of the patients had not responded to an average of 80 g sulphathiazole or sulphadiazine, or both. The remaining 500 had received an average of only 40 g of sulphonamide before penicillin was given All responded satisfactorily, 7 per cent of the 1000 cases had complications other than posterior urethritis, penicillin hastened recovery in this group, 15 per cent of the patients were followed up for 4 weeks and 2 recurrences were

noted The 100 cases of untreated acute gonorrhea received 20,000 units of penicillin intramuscularly every 2 or 3 hours for 5 doses, a total of 100,000 units, 97 responded successfully and only 3 required an additional 100,000 units. There were no serious toxic reactions. All cases returned for observation and 2 still had an active prostatitis (these were included in the 3 cases receiving two courses of penicillin). The writer concludes that penicillin is the most effective agent available for treating all types of gonorrhea, that 100,000 units will not cure all cases, and recurrences are possible

T H Sternberg and T B Turner<sup>6</sup> (U S Army) record a mass investigation in fifteen Army hospitals, 1686 soldiers, all refractory to at least two sulphonamide courses, and 286 unsuccessfully treated with hyperpyrexia, were given 10,000—20,000 units intramuscularly every three hours to a total of 40,000—160,000 units per case. One course of 160,000 units cured 98 per cent, 80,000—120,000 units, 96 per cent, and 50,000 units, 86 per cent. Individual injections of either 10,000 or 20,000 units or prolonging treatment beyond 12 hours seemed immaterial. Treatment of the failures with an additional 100,000 units gave 99 per cent cures. No case was penicillin-resistant or intolerant, but the development of early syphilis was delayed or masked in several cases. No other general or local treatment was given

A study on the action of penicillin by C P Miller, W. W Scott, and V. Moeller? (Chicago) stresses the rapidity of its therapeutic effect. A total dosage varying from 50,000 to 100,000 units was given intramuscularly to 21 patients. With one exception, every infection terminated abruptly. Two patients, who at first were treated solely by urethral instillations of penicillin, demonstrated its inability, when applied locally, to eradicate gonococcal infection from the anterior urethra. They were both successfully treated by intramuscular injections on the following day, indicating that penicillin is brought to the infected mucosa by the blood-stream rather than from the lumen of the irrethra.

The interval between onset of treatment and the first negative culture varied from 1 to 6 hours, and symptoms disappeared within 2 to 5 hours. The prompt disappearance of inflammatory reaction, which occurred almost simultaneously with the death of the infecting micro-organism and not after an appreciable time-lag, was particularly remarkable. The amount administered was 50,000 units in 3 cases, 60,000 units in 2, 75,000 in 2, 100,000 in 14. Size and spacing of individual doses varied, but in most cases did not extend over more than 5 or 6 hours. The only failure was an unusually severe infection in which, by error, only 60,000 units were administered. The ambulatory cases progressed as satisfactorily as those who were hospitalized. Although previous reports have advised spreading the injections over 24 to 48 hours, these authors believe such prolonged treatment unnecessary, either in acute or chronic gonorrhea, with or without complications

M H Dawson and G L Hobbys (New York) report that in a case of arthritis of the wrist with early destruction of the joint, sulphonamide therapy and other measures had proved ineffective, but the response to penicilin was unequivocal within 48 hours and the final outcome was a normally functioning joint. Another case of arthritis was treated locally by the injection of 10,000 units daily for 3 days into the knee-joint. The patient was discharged on the fifth day, when all signs of infection had subsided.

C J Van Slyke and S Steinberg<sup>9</sup> treated 136 seamen within an 8-hour day as out-patients to avoid hospitalization 98 patients received 4 intramuscular injections of 16,000 units between 9 am and 430 a.m., and a fifth injection at 9 am the next day, a total of 80,000 units—cure-rate was 87 per cent, 48 patients were given 25,000 units intramuscularly at 90 a.m., 1130 am, and

 $\bar{\bf 2}$  0 p.m , and 50,000 units at 4 30 p m , a total of 125,000 units within  $7\frac{1}{2}$  hours—cure-rate was 84 per cent

Forty-two women with gonorrhea, resistant to at least 2 courses of sulphathiazole, and 2 others sensitive to sulphonamides, were treated by A. Cohn, W E Studdiford, and I. Grunstein 10 Dosage varied from 50,000 units in 2 doses, to 100,000 units in 5 doses, at 3-hourly intervals 43 became bacteriologically negative during the follow-up period, the remaining patient relapsed, but responded to an additional 100,000 units in 4 doses, showing that individuals vary in susceptibility to this agent. A minimum total dosage of 75,000 units in 6 hours appeared satisfactory. Eleven patients suffered from concurrent Trichomonas vaginalis infection, which remained entirely unaffected. A child of 5 years, with a sulphonamide-resistant gonococcal vaginitis, was given 4 single doses of 10,000 units at 3-hour intervals, she promptly became negative and remained so during 25 days' observation. The course of pregnancy in 4 women was unaffected by penicillin

R B Greenblatt and A.  $\tilde{R}$  Street<sup>11</sup> had 5 failures amongst 109 women, they recommend 150,000 units. Chromic pelvic inflammatory disease with salpingitis and peritoritis frequently abated within 24–48 hours

Treatment with Penicillin and Sulphonamides Combined -Combined sulphonamide and penicillin was used by H C Oard, E V Jordan, M Nimaroff, and W J Phelan<sup>12</sup> (US Navy) for gonorrhœal urethritis Penicillin alone was used on 411 patients who had failed to respond to repeated courses of sulphathiazole and sulphadiazine They were given 10,000 or 20,000 units 3-4 hourly In almost all cases receiving 80,000 or more units. to a total of 160,000 units the urethral discharge disappeared and bacteriological cure resulted within Contrary to expectations there were no failures in the 78 cases receiving only 50,000 units of penicillin, but the urethral discharge abated more slowly (2-3 days) than in the group receiving the larger doses amides enhance the effectiveness of penicillin, a combination of sulphathiazole, 12 g in 2 days, and 50,000 units of penicillin-10,000 every 3 hours over 15 hours on the second day-was given to 232 patients, with only 10 (4 31 per cent) failures. Patients in this group were cured promptly, and failure to cure was obvious in 3 or 4 days When failure occurred, the patients were immediately given 100,000 units of penicillin alone All were promptly cured

Ophthalma Treated with Penicilin—Penicillin has been found by J E L Keyes<sup>13</sup> to be particularly useful in both local and systemic treatment of gonococcal infections, and parenteral treatment of eye diseases should therefore supplement local instillations in gonorrhocal ophthalmia in infants or adults. The present practice is to instil 2–3 drops of penicillin solution, 1000 units per c c, as frequently as every hour (or half-hour in severe cases). Intravenous and intramuscular dosages range from 5000 to 15,000 units, administered every 2 or 3 hours, with a total maximum dosage of 120,000 units in 24 hours.

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# GUNSHOT WOUNDS OF THREE PRESIDENTS OF THE UNITED STATES. Lambert Rogers, M.Sc., FRCS.

At a time when surgical effort directed to the treatment of gunshot wounds has never been so richly rewarded, it is of interest to notice some outstanding examples of gunshot injuries and their treatment in days gone by Three of the thirty-two presidents of the United States have died from gunshot wounds while holding office, and S B Harper, of the Mayo Clinic, has recently discussed

their injuries. As he says, it is interesting to speculate on what might be done to-day for wounds which cost Presidents Lincoln, Garfield, and McKinley their lives

Lincoln was shot by a revolver bullet which penetrated the occipital bone low down and to the left of the midline, traversed the base of the brain, and came to rest in the right frontal lobe after producing extensive communited fractures of both orbital plates of the frontal bone. The President lived about nine hours after the shooting, and during this time was in a deep coma with a slow pulse and exophthalmos.

President James A Garfield was shot at close range on July 2, 1881, by Charles Guiteau, a disappointed seeker of office in his administration. The bullet entered the 10th intercostal space about three inches to the right of the midline, fractured the 11th rib, and passing through the body of the first lumbar vertebra, but missing the spinal canal, came to rest in the retroperitoneal tissue near the spleen. President Garfield died on Sept 19, 1881, from infection and rupture of a traumatic ancurysm of the splenic artery which the passage of the ball had produced. During his two and a half months' illness three operations were performed, the sinus track being twice incised to promote better drainage. Drainage was also provided for a suppurative parotitis which developed

President William McKinley was shot twice, on Sept 6, 1901, by an anarchist, Leon Czolgosz One bullet just grazed the upper part of the sternum, the other entered the left hypochondrium and passed through the stomach to lodge in the muscles of the back The President was attending the Pan-American Exposition in Buffalo at the time of the shooting, and within 90 minutes an exploratory laparotomy was carried out in a small emergency hospital by Matthew Mann, a prominent local surgeon The perforations on both the anterior and posterior walls of the stomach were closed with a double row of silk sutures and the abdomen closed without drainage (Theodor Kocher, of Berne, had performed the first successful operation for gunshot wound of the stomach in 1884) Mann's decision to operate immediately was courageous, especially as in those days many leading surgeons practised conservatism towards gunshot wounds of the abdomen We may recall Sir William MacCormack's<sup>2</sup> statement made in the Boer War (1899-1901). "A man wounded in the abdomen dies if he is operated upon and remains alive if he is left in peace" For a week President McKinley made good progress, but then rapidly declined and died Autopsy showed no general peritonitis, and although no embolus was reported in the examination of the lungs it has been suggested that pulmonary embolism may have been responsible for the fatal outcome the surgeon was asked why he had not drained the abdomen he stated that there was nothing to drain This is still sound reasoning

S B Harper, in commenting on the treatment of these distinguished patients, states that Lincoln could probably not have been saved to-day any more than he could in 1865. Presidents Garfield and McKinley could probably have been helped materially by blood transfusion and chemotherapy we might add also by radiography and modern operating equipment.

References — Proc Mayo Chn 1944, 19, 11, Surgery of Modern Warfare, 3rd ed, 1944, 868, E. & S Livingstone

HÆMANGIOMATA IN CHILDREN. Sur John Fraser, M Ch, F R C S.Ed Increasing attention is being paid to the value of radiotherapy in the treatment of hæmangiomata, particularly of the infiltrating and growing type which is encountered in childhood. The subject was reviewed in the last issue of the Medical Annual (p. 297), when encouraging results were reported

from the use of radium emanation (radon) implanted within the tumour Throughout the past year favourable comments have continued to be presented, and it is evident that the method has a particular value

One of the most recent reviews comes from L T Byars 1 He adopts an unusual classification of hæmangiomata. It is as follows Port-wine stain, Venous angioma, Arterial angioma. It is difficult to understand the rationale of this grouping, it appears to be based upon clinical distinctions, but it is doubtful if one is justified in assuming that there is sufficient distinction in the contents of these tumours to warrant the recognition of venous and arterial types. However that may be, the real interest of the paper is concerned with considerations of treatment

Treatment.—Speaking of the *port-wine stain*, the author advises against radiation. He maintains that the lesion is so superficial that any form of radiotherapy initiates a dermatitis which is particularly difficult to arrest and to heal. For this class of lesion he recommends excision followed by skingrafting

In the venous tumour he practises excision, or, if the situation and relations make such impossible, he employs the injection of sclerosing solution

For the arterial hemangioma, while he agrees that there are instances (for example, small tumours) in which cautery destruction or excision may be indicated, his preference is definitely in favour of radiation therapy, and by radium rather than by X rays. In practice he employs interstitial implants of gold radon seeds, each seed containing 0.35 m c, and the total dosage being calculated as one radon seed per c.c. of tumour tissue. For this method he claims most satisfactory results, and the photographs which illustrate the article appear to support his claim (Plate XIV)

Byars acknowledges that he has encountered complications. The most troublesome has been secondary ulceration, generally the result of placing the radon seeds in an unduly superficial position. But difficulties have been rare, and the general impression is that radiation by means of radon implants offers a highly successful method of treating these disfiguring and troublesome lesions.

REFERENCE -1Surg Gymet Obstet 1948, 77 193

### HÆMOGLOBIN ESTIMATION.

Stanley Davidson, M.D., F.R.C.P. H. W. Fullerton, M.D., M.R.C.P.

The time-honoured methods of estimating the hæmoglobin of the blood have come in for much adverse criticism recently. In this country the Haldane (carbon monoxide hæmoglobin) and the Sahli (acid hæmatin) methods have been those most commonly used, and the main criticisms levelled against them are that drop-by-drop dilution of a solution until it matches a colour standard is a very inaccurate method, and that the colour standards may alter after they have been in use for some time. The Sahli method has the additional disadvantage that the colour formed by a mixture of blood and hydrochloric acid deepens gradually for a considerable time and therefore it is essential that a set period be allowed after mixing before dilution and matching are carried out. One result of all these criticisms has been a large amount of work on different methods of estimating hæmoglobin—for example, by measuring the iron content of blood, 1,2 and by using photo-electric photometers 3,4

At present none of these is very suitable for routine clinical use, although simple and compact photometers may yet be devised which will serve this purpose well. But another result has been the definition by the British Standards Institution of the colour standard used in the Haldane instrument Recent work<sup>1,5</sup> indicates that readings of 100 per cent with this standard are

## PLATE XIV

# HÆMANGIOMATA IN CHILDREN

(L T BYARS)



a Typical arterial angioma appearing during first 2 weeks of life and growing steadily until its present stage at the age of 6 months. The tip of the nose is involved with considerably more depth of tumour than is evident in the photograph. The mucous membrane of the underlying septum and the columella were also involved Treatment was by interstitial implantation of 5 gold seeds, each containing  $\frac{1}{2}$  millicurie of radon

b This single treatment sufficed for a cure as is shown in the picture taken at the age of 5 years There is no gross abnormality of the skin and the growth of the misal cartilages and bone has progressed normally

Reproduced from 'Surgery Gynecology and Obstetrics'



equivalent to 14.8 g Hb per 100 ml of blood and not to 13.8 g Hb as is stated. But the important practical point is that it is now possible to have instruments of the Haldane type tested, and, if an error is found, a suitable correction factor can be simply applied. This procedure should lead to more accurate hæmoglobinometry if the proper technique of using the Haldane instrument is carefully followed.

References —  $^1Bnt$  med J 1944, 1, 248 , \*Canad med Ass J 1944, 50, 550 ,  $^3Bnt$  med J 1944, 1, 48 ,  $^4J$  Path Bact 1944, 56, 95 ,  $^5Bnt$  med J 1944, 1, 250

#### HÆMORRHOIDS.

W B Gabriel, MS, F.R.CS

T. H Ackland,1 in a review of the dangers and complications in the treatment of hæmorrhoids, states that although it is widely held that the injection treatment of hæmorrhoids is never associated with serious consequences, this is not the case, and he has personal knowledge of three patients who required colostomy for extensive rectal necrosis following injection. The now wellproved technique for injecting hæmorrhoids with phenol in oil is described, and the use of a sufficiently long proctoscope is stressed. The striation sign gives reliable evidence of sufficient solution having been injected Complications are injection slough, stricture, fibrous tumours, and hæmorrhage operative treatment of hæmorrhoids is then considered the author states that Whitehead's operation and the clamp and cautery method are now seldom performed, and he speaks with enthusiasm of the advantages of Milligan's method of ligature and excision Complications such as hæmorrhage, stricture, pain, and retention of urine are discussed, also the method of managing the anal skin wounds when a dorsal fissure has to be excised at the same time The importance of leaving adequate skin bridges between the hæmorrhoid incisions is stressed Hæmorrhoidectomy should always be preceded by sig-[This is a very useful, accurate, and well-illustrated paper moidoscopy WBGI

D N Yaker² describes the fundamental importance of classifying hæmorhoids correctly. They can be placed into three categories. (1) internal, (2) external, and (3) mixed or intero-external. The situation of the three primary piles is described, and injection treatment is recommended for simple uncomplicated hæmorrhoids. Equally good results have been obtained with quinine and urea and mild phenol solutions, provided the technique is right. External hæmorrhoids which are covered by skin, and intero-external hæmorrhoids, should be treated by surgery. Yaker refers to the statistical study on hæmorrhoids by Kilbourne,³ who found that recurrence took place in 15 14 per cent of cases after injection, and he submits that very probably these recurrences took place after attempts to treat intero-external piles by injection

References  $-^{1}Aust\ N\ Z\ J\ Surg\ 1944,\ 13,\ 219$ ,  $^{2}Amer\ J\ Surg\ 1944,\ 65,\ 88$ ,  $^{3}Ann\ Surg\ 1934,\ 99,\ 600$ 

#### HEAD INJURIES

Geoffrey Jefferson, MS, FRCS

Concussion.—An experimental study of electric brain potentials made on dogs and monkeys by Earl Walker, J. J Kollros, and T J Case<sup>1</sup> as a guide to the physiological basis of concussion ended with the conclusion that a blow on the head led to a sharp rise of pressure inside the skull, and in the brain an intense stimulation. Concussion has always been regarded as a primary paralytic condition of the neurons. This new work indicates that although that is almost true, the first phase is the traumatic discharge of the polarized cell-membranes of the nerve-cells. There is a brief intense excitation to which the paralytic stage inevitably succeeds. The physical mechanism of depolarization, it is suggested, is the commotion consequent on the trauma. Pressure

waves develop which are quickly damped, the first two waves being much the largest. There are some seven or more waves in all, but they vary in height and number in different parts of the skull. It is their speed of alteration which does the damage. Walker et al. believe that the brain-stem may be pushed down as a result of the injury, because subarachnoid hæmorrhage was most commonly found at the base and there were often petechial hæmorrhages in the midbrain. With milder blows and quick recovery no hæmorrhages were discoverable.

Geoffrey Jefferson<sup>3</sup> had just previously declared that a mechanism of this order was the most probable basis of concussion He had revolted against the traditional belief that the phenomena of concussion could be accounted for on a basis of vascular alteration, whether that be anæmia or actual gross hæmor-In this paper he returned to the older view that concussion was due to inter-neuronal breakdown and predicted that its most significant site would be discovered to be not in the cerebral cortex but in the brain-stem Jefferson believed that we had gone as far as was possible in the elucidation of traumatic phenomena by histological methods, and that more accurate knowledge could only be derived by electrical and biochemical means Jefferson went on to suggest that the unconsciousness produced by a blow on the head is very like forced sleep, though not, of course, the same as sleep He therefore introduced the term "parasomnia" to designate it The so-called sleep centres are known to be situated in the hypothalamus and upper brain-stem, and there is a mass of chinical evidence that lesions in this region produced unconsciousness much more readily than do lesions in the cortex. Hence the presumptive localization in the brain-base of the disturbances that cause unconsciousness in head injuries. It was inherent in this belief that in the process of losing consciousness or in returning to it a stage might become "frozen", become a "still-life" picture rather than the extremely rapid succession of events that mark normal sleeping and awakening These long-drawn-out stages exhibited by some cases in recovery after head injury had never before been taken into proper account, although they are known to every clinician

B E Moore and J Ruesch<sup>3</sup> have since devoted a paper to this subject, on "prolonged disturbances of consciousness following head-injury" They have studied 39 patients with a phase of prolonged confusion, sometimes with incoherent talkativeness (traumatic delirium), restlessness, and aimless movement (discarding of bedclothes and plucking at bandages) These phenomena seem to be responses to stimuli of various genera, the significance of which the patient's clouded sensorium does not allow him to interpret correctly anthors refer to the state as one of fragmented mental expression which becomes eventually reorganized into coherence or may persist unchanged These cases represented 8 per cent of a series admitted to the Boston City Hospital No less than 54 per cent of the group could be regarded as having had psychopathic personalities before the accident (alcoholism being the most frequent aberration), many were over 50 The average duration of confusion was fifteen days, though 10 cases went on in this state for three weeks and some for longer Only 4 had subdural hæmatomas, though to what is it to be attributed? To no little degree it can be assigned to the personality of the patient, to a greater degree to a breaking up of physiological activities, of the physical basis of mind—though we do not understand fully One-third of these patients showed mental impairment what that implies Moore and Ruesch suggest that the persistent conthree to six months later fusional state is a stage forming part of a process of which a permanent dementia, of one degree or another, is the end. This is a valuable study, for it is certain that something happens to the brain mass in severe injury that may cause a general shrinkage D W C Northfield has described the enlargement of the ventricles ex vacuo that some such cases have Yet a proportion of these long confused and relatively hydrocephalic patients eventually recover completely Much, then, seems to depend on the pre-traumatic individual make-up of the injured in relation to his age, past history, and education—his performance as a social animal The important conclusion is that these changes are not due to long persisting high pressure inside the skull, at least not of a kind to be relieved by surgery

Battle Casualties —A feature of the management of head wounds from the fighting in NW Europe has been the use of air transportation brought quickly and safely back for operation those who could not be dealt with close behind the line Few of the cases have been any the worse for their journey, supporting the conclusion arrived at before that head injuries uncomplicated by severe injuries elsewhere travel well. It is probable, as Charles Donald pointed out, that the journeys to and from the airfields in the ambulances upset the patients more than the flight, often very short In this war the great majority of the operative work has been done by neuro-surgeons, young men mostly, but with a long training behind them that has given them judgement The results prove their excellencies, for so low a mortality would have been inconceivable a few years ago and was never even approached by the best in the last war The improvement is to be found in the control of infection by chemotherapy We have no means of knowing whether there has been any change in the percentage of those who undergo irrecoverable brain damage These cases have to be written off and we are left with those who could recover It is amongst these that the advantages of certain technical improvements have their opportunity But unquestionably a very great part has been played by bacteriostatics and bacteriocides Cobb Pilcher,4 in the USA, carried out a large series of experiments dealing with the action of various chemotherapeutic agents on the brain and meninges Sulphathiazole is the only one of the sulpha group which is dangerous if applied to the brain surface, since it causes fatal fits when it is put in too high a concentration in contact with the cerebrospinal fluid, i.e., it cannot be freely sprinkled on the brain surface It could be used in a local cavity in the brain Oral treatment with sulphadiazine significantly reduced the mortality of experimental animals in whom staphylococcal meningitis was induced experimentally and in those in whom a brain wound was made and contaminated wilfully with staphylococci

Interest, however, has chiefly been focused on the possibilities of penicillin This agent if given intramuscularly or intravenously does not reach the cerebrospinal fluid in sufficient concentration to be of any real value when injected directly into the cerebrospinal fluid penicillin has a strikingly beneficial effect on both staphylococcal and pneumococcal meningitis the original observations on wounded soldiers by W H Florey and H Cairns (referred to briefly in last year's MEDICAL ANNUAL, p 141), penicillin solution was injected into the wounds locally by a fine rubber tube left in the sutured wound at the close of a very thorough operation. In others the wounds were sutured after dusting with a penicillin powder, but this is much less available than is the solution The fault of penicillin is its inability to deal with Gram-negative organisms, but we must be thankful for its valuable properties and not blame it for its defects. In all cases sulpha drugs have been given orally or intravenously as additional treatment. The results in the small series reported to the War Office by Florey and Cairns have been confirmed by the much larger experience that came from the battle casualties in Normandy, whilst certain happenings brought about considerable modification of the technique of penicillin administration The chief of these has been the gradual abandonment of the local use of penicillin by daily injection through a tube because of the dangers of secondary wound infection McKissock early saw the risks of this and devised a sterilizable stopper for the rubber tube to prevent contamination The common surgical practice at the moment is to leave 5000 or 10,000 units of penicillin-sulphamezathine solution in the wound just before it is sutured, or to inject it with a Record syringe afterwards, and then to give penicillin by the intramuscular route Sulphamezathine or sulphadiazine or sulphathiazole are given by mouth as well. The mortality has been reduced to somewhere around 7 per cent in back areas and about 15 per cent in those far forward. The latter figures naturally include more cases with irreparable cerebral damage, whilst in the back areas the deaths are chiefly, but not entirely, due to sepsis

Very rarely has death from infection been due to organisms known to be susceptible to penicillin H Cairns<sup>5</sup> has reviewed some of the results in the

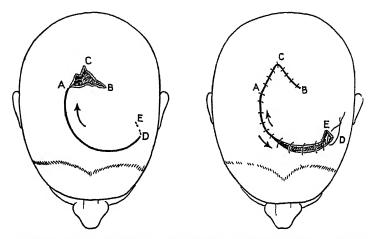


Fig 27—a, Single rotation flap
with no tension over danger point

Note optional extension from D to E b, Result
Tension distributed over area of no importance

special penicillin number of the British Journal of Surgery (1944), which contains a series of valuable papers. One of the most instructive groups of cases is that of Shoreston in Italy—78 cases treated with penicillin-sulphathiazole with only 7 post-operative infections and only 1 death from that cause, whereas in a series of 76 cases treated with sulphathiazole alone there were 22 infections and 6 deaths from sepsis. It is uncertain yet how far systemic is better than local treatment for brain wounds. One must not be misled by the observation that penicillin does not easily pass the brain-c s.f. barrier. In head wounds the major and probably the most dangerous part of the wound from its infective potentialities is that of the scalp and bone, i.e., tissues in which parenterally administered penicillin circulates in adequate concentration. A single local dose of, say, 10,000 units into the wound at the close of a complete débridement followed by intramuscular penicillin for 5 days or so, reserving intrathecal or intraventricular instillation of penicillin for such time (if it ever comes) as signs of cerebrospinal infection arise, may well prove to be the ideal method

This has been the plan evolved by the Canadian Unit and eventually by McKissock and Logue Dural closure, by the way, has been effected in most cases, but the wisest surgeons do not make it absolutely watertight. In fact, one wonders whether 'watertight' closure of the dura is at any time more than a picturesque expression

That the skin must be closed, if there is any hope of inducing healing without infection, is axiomatic A healing wound is self-sterilizing. An unhealed

penetrating brain wound turns into that sort of an ulcer that we call a cerebral fungus, something that we do not want to see is closure always possible? Dural closure can be assisted by a small stamp of pericranium or temporal fascia or by the use of Ingraham's "fibrin foam", a truly remarkable issue of Cohn's from the blood byproduct laboratory at Harvard Skin closure requires the correct planning of skin flaps, and Sir Harold Gillies has shown us how crude our methods of repairing wounds have He advocated the swinging of flaps of sorts best understood in diagrammatic Sometimes a very large flap has to be cut, and although this may much prolong an operation, it is very well worth while, for it may in the end prove to have been a vitally important step in saving a life. It would, indeed, be difficult to stress too emphatically the proved necessity of closing the wound As a guide it can be said that



Fig 28 —Defect of forehead Rotation flap includes hairy and non-hairy scalp Hair-line lowered unilaterally

the principle underlying the fashioning of flaps in each individual case is that no tension shall fall on the essential site to be covered, that the flap must be limp and not tightened again by subsequent stitching elsewhere This is so important a matter that it needs illustrating (Figs 27-29)

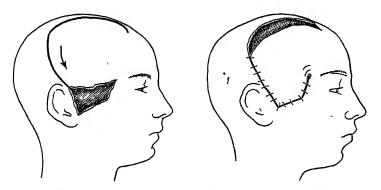


Fig 29—a, Subtemporal wound Design for flap b, Suture of flap (Figs 27-29 by kind permission of 'The Lancet')

REFERENCES — J Neurosurg 1944, 1, 103, \*Brit med J 1944, 1, 1, \*New Engl med J 1944, 230, 445, \*Ann Surg 1944, 119, 509, \*Brit J Surg 1944, \$2, 199 (Penicillin Number), \*Lancet, 1944, 2 310

# HEARING CENTRE, LOCALIZATION IN THE.

F. W Watkyn-Thomas, FRCS.

The greatest difficulty in the past in determining the cortical representation of hearing was that it was not realized that each ear had almost complete bilateral representation Now that this fact has been clearly established it is possible to trace the course of individual fibres from cochlea to cortex On the Helmholtz theory of hearing there must be localization of tone right up to the highest centre The fibres have been traced already to the medial geniculate body Now C N Woolsey and E M Waltz1 describe "topical projection of nerve-fibres from local regions of the cochlea to the cerebral cortex of the They exposed each turn of the cochlea, electrically stimulated fibres as they entered the lamina spiralis, and showed by a cathode-ray oscillograph that stimulation of fibres in each region of the cochlea produced a response in a definite region of the auditory cortex They were able to demonstrate two main areas, a region of maximal response, which is probably the primary projection area, and an outlying secondary response area ventral to it, with a higher threshold of excitation The evidence available suggests that the primary area derives from the pars principalis of the medial geniculate and the secondary area from a special projection group from the pars magnocellularis. It is legitimate to deduce from these facts that we have here a proof of the localization of tonal frequencies in the cortex

REFERENCE -1Bull Johns Hoph Hosp 1942, 71, 315

HEART. (See also Angina Pectoris, Arrhythmia, Cardiac, Electrocardiography; Endocarditis)

HEART DISEASE, CONGENITAL (See also PATENT DUCTUS ARTERIOSUS, RADIOLOGY) William Evans, MD, FRCP

Radiological Findings in Patent Ductus Arteriosus.—M S Donovan, E B D Neuhauser, and M C Sosman¹ call attention to the successful ligation of a patent ductus arteriosus, pointing out that a total of 50 cases have now been ligated or divided by Gross, with 3 deaths, 7 of them had bacterial (streptococcal) endocarditis. All the patients were examined radiologically before the operation. The authors declare that the radiological signs have a definite value, although they do not prove the diagnosis, nor does their absence rule it out. The findings in order of frequency were dilatation of the pulmonary artery, cardiac enlargement, dilatation of the left auricle, engorgement of the intrapulmonary vessels, exaggerated pulsation of the left ventricle and the pulmonary artery, pulsation of the vessels in the hila of the lungs (hilar dance).

Surgical Treatment of Patent Ductus Arteriosus.—M J. Shapiro and A Keys² have presented an analysis of the results of 140 operations to ligate the ductus arteriosus. They stated that although the great majority of patients with this congenital defect suffer no serious disability or restriction of activity during most of their lives, their life expectation was greatly shortened by the continued presence of the defect. Ligation of the uninfected ductus can be made with a mortality of less than 10 per cent, ligation in the presence of bacterial endarteritis offers an even chance of survival in the face of practically certain death without ligation. The danger of infection in the ligated ductus cannot be estimated properly as yet. They concluded that the majority of patients should be sent to surgery after careful clinical studies have been made. Ligation should be attempted immediately bacterial endarteritis develops.

Pulmonary Tuberculosis in Congenital Heart Disease.—O Auerbach and M G Stemmerman³ have reported on 13 patients who had congenital heart disease and contracted pulmonary tuberculosis, upon 7 of whom post-mortem examinations were performed. The most common congenital defect was pulmonary stenosis, which was present in all cases which came to necropsy, implying a certain predisposition of these patients to tuberculosis. The pulmonary disease ran a course typical of it and irrespective of the cardiac lesion. The heart was seldom affected by the superimposed respiratory infection. In view of this observation, together with the fact that the patients succumbed to the pulmonary involvement rather than to failure of the defective cardiovascular system, active treatment of the tuberculosis was recommended. Pneumothorax induced in 5 of their patients did not lead to congestive heart failure in a single case.

REFERENCES — Amer J Roentgenol 1948, 50, 293, Amer J med Sci 1943, 206, 174, Ind 1944, 207, 219

# HEART FAILURE

William Evans, MD, FRCP

Cardiac Output in Man.—J McMichael and E P Sharpey-Schafer¹ have reported serial estimations of cardiac output and right auricular pressure obtained by passing a ureteric catheter along the arm veins into the right auricle Cardiac output in the supine posture showed a 33 per cent increase over that in the erect A fall in right auricular pressure reduced, and a rise in right auricular pressure increased, the cardiac output Acceleration of the heart with atropine usually increased cardiac output and caused a fall in the right auricular pressure Intravenous adrenaline increased the cardiac output in doses that did not accelerate the heart nor raise the blood-pressure

Treatment by Mercurial Diuretics—Further evidence of the effectiveness of a mercurial diuretic when taken by mouth has been provided by R C Batterman, A C De Graif, and J E McCormack, who gave tablets of mercupurin to 42 patients with heart failure. The drug was given as 5 tablets at once or as 2 tablets three times a day for 2 to 4 days. Satisfactory diuresis was gained by either method in a high proportion of cases, and it was enhanced by taking ammonium chloride at the same time. It had the effect of reducing the frequency of attendance of patients with heart failure at hospital for periodic intravenous injection of a mercurial diuretic

Death from Intravenous Mercurial Diuretics.—H Evans and K M A Perry³ reported sudden death in 6 patients following the intravenous injection of a mercurial diuretic, salyrgan in 3, neptal in 2, and mersalyl in 1 Four patients had nephritis and two had heart failure, one after old cardiac infarction. They considered it inadvisable to give mercurial diuretics intravenously to patients with a low plasma protein.

to patients with a low plasma protein

J Wexler and L B Ellis<sup>4</sup> reported 2 deaths from mercupurin The first fatal reaction occurred in a patient aged 24 with heart failure from congenital pulmonary stenosis. There had been a fair response over a period of eight months, during which 164 c c of mercupurin had been given intravenously. When the patient's condition commenced to deteriorate and the diuresis lessened, the drug was increased to 3 c c three times a week. After one of such injections the patient became very short of breath and died within two minutes. The second fatality occurred in a woman aged 27 with nephrosis, and at the fourteenth injection.

[Since mercurial diureties are so commonly employed in the treatment of lieart failure, it is necessary to emphasize the rarity of untoward effects when these are considered alongside the fact that this therapeutic measure is used with success and safety in such a large number of patients. Two precautions

need to be kept in mind, however, in the treatment with mercurial diuretics of patients presenting cedema. The first concerns cases of heart failure where the diuretic response, previously good, begins to fail and the cedema increases; in such patients the drug should be decreased rather than increased. The second applies to cedema of nephritic origin, intravenous injection should be withheld in these cases until a good diuretic response has been gained in the first place by intramuscular injection —W E ]

Congestive Cirrhosis.—The term cardiac cirrhosis has gained widespread usage, but congestive cirrhosis is a more accurate designation since it applies directly to the condition in the liver S Koletsky and J. H Barnebees have studied the nature of fibrosis of the liver in chronic passive hyperæmia, its frequency, and its relation to various forms of heart disease. They accepted a diagnosis of cirrhosis only when there was definite alteration of architectural The degree of fibrosis and distortion of pattern pattern in addition to fibrosis were much less than in well-developed Laennec's cirrhosis The main aetiological factor was prolonged and severe hepatic venous stasis episodes of decompensation favoured the development of the condition most severe degree of fibrosis and architectural change was found in patients with chronic constrictive pericarditis 
The continual venous stasis in such cases suggests that the cirrhosis develops as a progressive process. It was relatively common in patients with rheumatic heart disease with mitral stenosis or with combined valvular lesions, and it was uncommon in other forms of heart Koletsky and Barnebee considered that the clinical aspects of congestive cirrhosis did not provide adequate data for ante-mortem diagnosis

REFERENCES — Brit Heart J 1944, 6, 33, \*J Amer med Ass 1944, 124, 1243, \*Lancet, 1943, 1, 576, 'Amer Heart J 1944, 27, 86, \*Amer J med Sci 1944, 207, 421

### HEART SOUNDS.

William Evans, M.D., FRCP

Triple Heart Rhythm.—By triple rhythm is meant the cadence produced by the recurrence in successive cardiac cycles of three separate sounds. When the position of the adventitious sound was considered alongside the clinical state of the patient in 270 cases with triple rhythm, W Evans¹ found that they could be arranged in three groups

In the first group the added sound was the third heart sound occurring in early diastole. This group comprised healthy subjects and patients with right heart failure. The former is told from the latter by the site of maximum audibility of the sound, the effect of posture, the age, and the health or disease of the heart. The conditions causing right heart failure initiating triple rhythm included mitral stenosis, hypertension, thyroid toxemia, congenital heart disease, emphysema, pulmonary embolism, and pericardial disease

In the second group the fourth heart sound is added during auricular systole and at the end of ventricular diastole. Here also there were two varieties, the first being caused by delayed A—V conduction (prolonged P-R interval in the electrocardiogram), and the second by left ventricular failure in hypertension or less commonly in aortic incompetence

In the *third*, and least important, group, an extra sound is added in late systole, it occurs in health, and almost its only importance lies in distinguishing it from the third heart sound

Evans said that triple rhythm was a common auscultatory sign and could be of great aid in the diagnosis of cardiovascular disorders, it should be methodically sought in all such cases

REFERENCE -1Brit Heart J 1948, 5, 205.

HEART-BLOCK. (See ARRHYTHMIA.)

### HEAT EFFECTS: HEATSTROKE AND HEAT HYPERPYREXIA.

Sir Philip Manson-Bahr, CMG., DSO, M.D, FRCP

In a Memorandum<sup>1</sup> issued by the Director of Medical Services to the Persia and Iraq Force, it is stated that during the hot weather of 1942, nearly three-quarters of the cases of general effects of heat among troops in Persia and Iraq occurred before, during, and after disembarkation Many could have been prevented had adequate precautions been taken on board ship.

In the aetiology of conditions due to heat, the exogenous factors of high atmospheric humidity (with a wet-bulb temperature of 83° F as the danger point), rapid dehydration, deficient intake of fluid or salt, and lack of rest are mentioned. The endogenous factors include non-acclimatization, alcoholism, fevers, and diarrheea. Illnesses associated with high fever or vomiting are specially dangerous.

Microscopic examination of tissues in fatal cases of heat hyperpyrexia shows great venous engorgement of all organs, with hæmorrhagic pulmonary cedema, and multiple hæmorrhages, sometimes in the brain. The cause of death is usually circulatory failure.

The classification in this Memorandum is as follows ---

Heat Exhaustion.—This is common and not usually serious. It is in fact a fainting fit, with a normal temperature, but often associated with heat cramps

Subacute Effects of Heat.—These are important The onset is insidious—an apyrexial period of increasing derangement of body chemistry, with a final phase of high fever. The condition begins with lassitude and headache, going on to nausea and vomiting, giddiness, and insomnia. Frequency of micturition is sometimes noted. The mentality may change to duliness or irritability. Signs of dehydration appear and chlorides in urine are below normal. This stage usually lasts 7–10 days, but may be longer, and, unless checked, it may progress to hyperpyrexia.

Acute Heat Stroke.—In this form failure of the heat-regulating mechanism is sudden and an apparently healthy man may be attacked so quickly that he is unconscious when found. Usually there is delirious coma or convulsions. The skin is dry, the temperature may reach 112° F, the face is congested, and the muscles are rigid. The cerebrospinal fluid is normal in appearance and the pressure is rarely raised. A warning is given that over-rapid removal of cerebrospinal fluid may lead to the formation of a dangerous pressure cone which may compress the medulla in the foramen magnum.

Heat Cramps.—These are seen characteristically in ship stokers. They are caused by deficiency of sodium chloride, due to excessive sweating. Treatment must be instituted early. Essentials are cool atmosphere, rest, replacements of fluids and salt, and reduction of body temperature either by imitation of process of evaporation of sweat, or by immersion in cold bath. Cooling measures must be stopped when the temperature has fallen to 102° F. (from 106°) or 104° F (from 109°) to avoid dangerous collapse. Antipyretic drugs are dangerous

Fluids must be given in large quantities—as 0 25 per cent saline drinks, or intravenous normal saline. The fluid and salt requirements should be regulated by appearances of dehydration, blood concentration (estimated by redcell count or percentage of hæmoglobin), the amount of urine, the amount of chloride in the urine, and the blood-pressure (usually low). Intravenous saline is indicated if the systolic blood-pressure is below 100 mm. Hg. A balance-sheet of fluid intake and output should be kept, and fluid given in large quantities until the total output balances the total intake. In this balance-sheet at least 8 pints must be allowed for the daily loss of fluid by sweating of a man at rest in a moderately cool room in hot weather. Intravenous

administration of fluid calls for great care, for the cardiovascular system may be unable to deal with it—Signs of this are failure of blood-pressure to rise, absence of clinical improvement, and pulmonary ædema. Some can take 20 pints, others are drowned by 9—It is often difficult to exclude malaria. If in any doubt 8–10 gr—quinine must be given slowly by the intravenous route

In prevention, acclimatization is very important. Healthy men become acclimatized in a few weeks. Lectures should be given on precautions necessary. Ample supplies of water must be made available, and a daily ration of to of salt must be taken daily for several days before entering heat-stroke areas. The minimum daily fluid requirement in the hot season is 10 pints. A man doing hard manual work may take almost 4 gallons.

The test for chlorides in urine is performed as follows. To 10 drops of a 24-hour specimen of urine is added one drop of 20 per cent potassium chromate solution. This gives a canary yellow colour. Silver nitrate (2.9 per cent solution) is added drop by drop till the colour changes to brown. The number of drops of silver nitrate equals the amount of sodium chloride in grammes per litre.

REFERENCE — Effects of Heat in Persia and Iraq, Persia and Iraq Force, Director of Medical Services, Medical Memorandum No 4 of 1943 (republished with amendments, June, 1943)

## HEPATITIS, INFECTIVE.

Sir Henry Tidy, MD, FRCP

H P Himsworth and L E Glynni (University College, London) have published an important experimental investigation on the aetiology and pathology of hepatitis This is an extension of recent work in which cirrhosis of the liver has been experimentally produced by abnormal diet. Previous observers have recognized that a proportion of animals taking such diet develop, inconstantly and irregularly, hepatic necrosis 
It was generally assumed that this necrosis was but a transient stage in the sequence leading to cirrhosis, but Himsworth and Glynn have been able to show that the two conditions are entirely distinct The authors found that rats, given a low protein diet, develop massive hepatic necrosis Further experiments suggested that a component of protein rather than an intact protein molecule constituted a protective factor, and this they finally identified as methionine, an amino-acid in which casein is particularly rich, and they proved its protective power Massive hepatic necrosis is always followed by scarring and, given sufficient period of survival, by nodular hyperplasia This latter lesion may sometimes resemble portal cirrhosis, but is really distinct from it True portal cirrhosis can be produced by diets which cause heavy fatty infiltration of the liver, either by excess of dietary fat or a deficiency of lipotropic factors. If the amount of dietary protein is sufficient the lesions develop without necrosis Generally the differences are equally marked massive necrosis manifests itself as an acute illness, dietetic portal necrosis as a gradual deterioration of health original article must be studied for the details of this important work, but the results are summarized as follows (1) Two types of experimental hepatitis in rats can be distinguished (a) toxipathic hepatitis due to the direct action of noxious substances on the liver cells, and (b) trophopathic hepatitis due to dietary deficiency of a component of protein (2) Experimental toxipathic hepatitis develops rapidly, shows a diffuse zonal necrosis, and in survivors recovery is complete Repeated exposures, however, produced a diffuse hepatic cirrhosis (3) Experimental trophopathic hepatitis only develops after a long latent period The liver shows massive necrosis which leads to post-necrotic scarring, and when severe to nodular hyperplasia (4) In man the features characteristic of toxipathic hepatitis are seen in the hepatitis following exposure

to such poisons as chloroform. The hepatitis of eclampsia and infective hepatitis and in that following treatment with the organic arsenical preparations also appears to be of this type. (5) In man massive necrosis and its sequel, nodular hyperplasia, can be attributed to a trophopathic hepatitis. It may possibly arise as the direct result of a dietary deficiency. Most commonly it is developed as a complication of a preceding illness, and it is then to be regarded as a conditioned deficiency disease, distinct and separate from the illness which it complicates. Restriction of the intra-hepatic circulation is an important predisposing cause of trophopathic hepatitis in man. It most commonly results from a swelling of the liver cells previously injured by a toxipathic agent Pregnancy, vomiting, and anorexia may reduce the amount of protective nutriment available. Certain poisons, such as TNT, can produce the condition by combining with components of protein so as to render them inutilizable.

- J. Beattie, P H. Herbert, C Wechtel, and C W. Steele<sup>2</sup> (Royal College of Surgeons, London and a U.S A. Military Hospital, E TO) have made a careful study of a case of carbon tetrachloride poisoning treated with casein digest and methionine A man\_aged 23 swallowed by mistake between 30 and 40 ml of carbon tetrachloride This is about ten times the maximum therapeutic Symptoms of dizziness began almost immediately. He came under treatment nuneteen hours later, when he was found to be restless with jerky movements of the limbs and head The liver was already enlarged and tender There were no other abnormal signs or symptoms. He was given 2 g. of methionine by mouth and subsequently a continuous infusion of the solution by a Murphy drip apparatus This was stopped after three hours when he had received 436 ml, owing to the development of shock By this time the liver had further enlarged The next day he had improved On the following day he appeared to be relapsing and was given 4 g of methionine by mouth From that time he made a rapid recovery, and in a few days the liver retracted and he stated that he was fit to return to duty The original intention was to administer 15 g of methionine calculated on the basis of 0 25 g. per kilo of body-weight, which was approximately the dosage used by Miller and Whipple, but in fact only 9 5 g was infused in addition to that given by the mouth. The nitrogen and sulphur balances were carefully determined From the size of the dose and the rapid onset of the symptoms it is probable that there would have been a fatal outcome in the absence of this treatment
- F. O MacCallum and D J Bauer<sup>3</sup> (Wellcome Bureau of Scientific Research, London), investigating homologous serum-jaundice, record some transmission experiments with human volunteers. One normal man and two men recently convalescent from yellow fever vaccine jaundice were given inoculations of homologous serum. The two yellow fever vaccine jaundice convalescents remained well. The normal man developed jaundice after 89 days. He was bled on the 7th day of recognized jaundice and also after 59 and 134 days. No transmission of jaundice was observed from the bleedings after 59 and 184 days, 23 volunteers for the blood taken on the 7th day were available for inoculation, and a few more were subsequently added. The inoculations were performed as follows, and the results are given in Table I.

#### SERUM

Serum taken on the 7th day of jaundice
Group 1a V 1-5, subcutaneous mjection 0 5 c c
Group 1b V 6-10, intranssal instillation 1 0 c c.
Serum taken 66 days after the onset of jaundice
Group 2 V 11-15, subcutaneous injection 0 5 c c
Serum taken 141 days after the onset of jaundice
Group 8 V 16-20, subcutaneous injection 0 5 c c

#### TISSUE CULTURE

2nd passage supernatant (1/125 dilution of original serum)
Group 4a V 21-23, subcutaneous injection 0 5 c c
9th passage supernatant (dilution 10-")
Group 4b V 24-23, subcutaneous injection 0 5 c c
15th passage supernatant (dilution 10-")
Group 4c V 29, subcutaneous injection 1 0 c c, V 30, subcutaneous injection 2 0 c c and intranasal instillation 2 0 c c

Table I—Clinical Findings in Subjects showing Liver Damage within 6 Months of Inoculation with Serum and Cultures from the Case referred to

Volun- TEER	Urobilin Excess	Bile in Unine	Rise in Serum Bilirubin	Sym- PTOMS	JAUNDICE	
	Days after moculation					
1 2 3 4 6 6* 7 8	65-79 70-77 97-122 32-39 94-115	65-79 70-77 89	65-87 58-77 97-122 107-125 24 80-120 87-108 55-65	56-63 54-70 36-46 80-130 106-110	63-93 70-77 39-42 80-180	
21 24 25	101-108 81-88	81–88	101-108 79-180 93-119	94-108 84-180 108-119	88-?†	

<sup>\*</sup> Relapse

The second series of experiments was with an interogemic serium. A batch of YFV (No 207KY) caused jaundice in a large number of subjects after an incubation period varying from 56 to 172 days. It was possible to obtain a sample of the serium used in its preparation, thus affording the first opportunity for testing the hypothesis that jaundice developing after the injection of YFV is caused by the serium contained in it. A number of volunteers were inoculated with tissue cultures of dried egg embryo material, but all the results in these were negative. Eleven volunteers received subcutaneous injections, and five (Nos 32-36) received intranasal instillations. The positive findings are recorded in Table II

Table II —Findings in Subjects receiving Serum 207ky who Showed Signs of Liver Damage within 6 Montes of Inoculation

Volun- TEER	Urobilin Excess	Bile in Urine	Rise in Serum Bilirubin	Sym- PTOMS	Jaundice	
	Days after inoculation					
33 34 35 37 38 39 46	85-107 54-108 86-114 99-120 109-?	61-62 86-110 100-118 125	79 97-111 54-80 86-114 99-126 120-? 54-118	69-107 50-92 89-104 99-126 127-132	59-96 93-114 100-130 129-135	

The author draws the following tentative conclusions (1) Serum from a presumed case of homologous serum jaundice was interogenic on the 7th day after the onset of jaundice, but not 59 and 134 days later. (2) A batch of YFV

<sup>†</sup> Icteric weal, no jaundice

containing pooled human serum obtained from a blood-bank produced jaundice in 30 to 40 per cent of those inoculated with it—Inoculations of the same serum by itself produced hepatitis in a similar percentage of volunteers—(3) The interogenic agent survived heating at 56° C for one hour, and was still very active after storage for 14 months in the dried state—(4) A number of those moculated with interogenic serum showed evidence of liver damage of insufficient severity to produce jaundice

M H Salaman and others' (RAMC) have examined experimentally the suggestion of MacCallum that jaundice resulting from anti-syphilitic treatment may be spread from patient to patient by means of syringes imperfectly sterilized between injections. Bigger has previously shown that the technique employed in many VD clinics cannot be relied on to prevent the transference of an infected agent, the danger arising from the aspiration of blood into the syringe. The authors employed a special technique of intravenous injections, for the details of which the original article must be consulted. The result of the new technique compared with the old is shown in Table III.

Table III.—POST-ARSENICAL JAUNDICE

A Influence of Technique on Incidence

Tech- Nique	WHERE TREATED.	4 Months		6 Months	
	DATE OF BEGINNING TREATMENT	No Treated	Jaundice	No Treated	Jaundice
Old	Netley and elsewhere, between February and November, 1943 Netley only between	67	25 (87 per cent)	56	38 (68 per cent)
	July and November, 1943	86	1	18	1
	B Influence of Length	t of Treatm	ent and Place	on Inciden	ice
Old	Netley only Netley and elsewhere Between February	23 44	7 18	18 38	12 26
	and June, 1943 Between July and November, 1948	53 14	18	44 12	28 10

There was only one case of jaundice among 30 patients treated for more than four months by the new technique, 18 of whom had been treated for over six months. In the control group of 67 cases there was an incidence of jaundice of 37 per cent at four months and of 68 per cent in 56 of these followed for six months. The authors point out that the type of post-arsenical jaundice developing between the fifth and fifteenth days has a different aetiology and probably has no relationship to the technique of injection used

J Beattie and J Marshall<sup>5</sup> (Royal College of Surgeons of England), under the title of "The Aetiology of Post-arsphenamine Jaundice", conclude from evidence based on epidemiological grounds that post-arsphenamine jaundice or homologous serum jaundice on the one hand, and infective hepatitis on the other hand, are due to two different infective factors. They exclude the early type of jaundice which usually appears within the first two weeks after the first injection of the drugs forming arsenical therapy, and which is generally accepted as being of a different aetiology to the jaundice usually becoming obvious between the 12th and 17th week of treatment. Their cases were all

patients suffering from early syphilis who were being treated with neoarsphenamine by the routine British Army method Of 119 cases of jaundice, 90 (viz., 76 per cent) occurred during the twelfth to seventeenth week inclusive presence of 50 cases occurring after longer periods might be explained by assuming that infection did not take place until some injection later than the This incubation period is about three times as long as that determined by Pickles, Edwards, and Ford for infective hepatitis in non-syphilities in which there was no possibility of transmission by inoculation Assuming that two diseases exist and that the infective factors are different, the authors consider the question whether immunity conferred by one disease might not protect against the other It is known that one attack of infective hepatitis apparently confers almost complete immunity against re-infection. In a series of 280 cases of syphilitic jaundice, 7 subsequently developed a second attack of jaundice, of which 5 were considered to be possibly infected with infective hepatitis. At a second hospital the jaundice ward contained both types of jaundice, and during a period of six months 80 cases of syphilitic jaundice and 40 of infective hepatitis were treated While there were no relapses or re-infection in any case of infective hepatitis, 5 so-called relapses occurred in the syphilitic patients. Assuming that the latter were through infection with infective hepatitis, infected while in the ward, the infection list was at 6.3 per cent as compared with 1.8 per cent of the first hospital In the second hospital all the 40 case of infective hepatitis had received yellow fever inoculations at least eight months previously, and of these 40 cases 5 had developed jaundice within four months after their yellow fever inoculation. It would therefore appear that post-vaccinal yellow fever jaundice does not confer immunity against an attack of infective hepatitis. The authors consider they had insufficient data by which to judge whether the reverse is true

A M. McFarlan, George Chesney, and Paul Beeson<sup>6</sup> (American Red Cross Harvard New Hospital Unit) have carefully reviewed a number of cases of hepatitis following injection of mumps convalescent plasma. An epidemic of mumps occurred in a training centre which contained a high percentage of susceptibles, and an attempt was made to control it by passive immunization of those susceptible. 470 men were inoculated with plasma prepared from convalescents, and of these 44 (7 per cent) developed hepatitis. The authors arrived at the conclusion that the hepatitis was due to an agent present in one of the two lots of plasma used, and that the agent was probably not the virus of infective hepatitis. [Their conclusions that there are two different agents is in agreement with the communication of Beattie and Marshall, summarized above, but was arrived at independently and on slightly different grounds—H. T.]

REFERENCES — Lancet, 1944, 1, 814, \*Brit med J 1944, 1, 209, \*Lancet, 1944, 1, 622, \*Ibid 2, 7, \*Brit med J 1944, 1, 547, \*Lancet, 1944, 1, 814

HERNIA. A Rendle Short, MD, FRC.S

Ingunal Hernia.—N Das,¹ of Fem, finds that in India herma is much commoner amongst Hindus than in Moslems, probably because the muscular system of the former is poor. He uses a strip of the sac to repair the abdominal wall, instead of obtaining a fascial graft from the thigh. C. C. Barton,² of Dayton, Ohio, has repaired hernias by the Gallie method on 385 occasions, 321 of which have been reviewed after one to five years. There were 8 recurrences, 3 infections, 3 cases of testicular atrophy, and 5 of hæmatoma. W. J. Ryan,² of Philadelphia, obtains his strip of fascia for the repair from the external oblique aponeurosis, pedicled at the public spine. He has seen no recurrences in about a hundred cases, but some of his follow-ups were very recent. [A

brief trial of this method some years was discouraging, as several of my patients had a return of their hernia, and I gave it up —A R. S.]

Causes of Recurrence.—These are discussed by P Sanyal, of Calcutta, and Lieut-Colonel W Patrick, of Glasgow Sanyal finds that in Indian patients the site of reappearance of the herma is nearly always at the mesial end of the suture line Special care should be taken here Patients should stay in bed three weeks Patrick considers that in half the cases competent surgery would have avoided the recurrence. Usually the sac has not been adequately removed. He attaches importance to getting the patient into hospital early and prescribing muscular exercises both before and after operation, designed to strengthen the lower abdominal muscles The post-operative exercises begin on the tenth day The Bassini operation is totally inadequate

Pulmonary Complications after Herniorrhaphy.—In his experience of surgery in the RAF, Squadron-Leader BG B Lucas found these unduly frequent Mild coughs were just as often met with when pentothal followed by gasoxygen was the anæsthetic used as in a series of patients who were given ether, but severe chest complications were more often seen after ether. He believes that the main source of the trouble is that the main is afraid to breathe deeply because of pain in the groin, so that plugs of mucus collect in the lowest bronch The remedy is either to urge the patient to breathe deeply, or to use long-standing local analgesia

Strangulated Umbilical Hernia.—W A White, of Boston, USA, discusses the treatment of large umbilical hernia in old, obese, bad-risk patients. His mortality was 33 per cent, or in emergency cases 48 per cent. Gangrene of the bowel is quite unusual. His suggestion for improving these unhappy figures is that the surgeon should content himself with a simple division of the constricting ring under local anæsthesia, push back the rupture, and apply a pad and pressure without any attempt at a formal repair operation

REFERENCES — Indian med Gaz 1944, 79, 3, \*Surg Gynec Obstet 1943, 77, 530, \*Ibid. 585, \*J Indian med Ass 1943, 13, 17, \*Brit J Surg 1944, 31, 231, \*Proc R Soc Med 1944, 37, 145, \*Surg Gynec Obstet 1943, 77, 514

# HIRSCHSPRUNG'S DISEASE: TREATMENT BY SPINAL ANÆSTHESIA. Regunald Muller, M D, F R C P

In giving a spinal anæsthetic as a pre-operative test of suitability for lumbar sympathectomy in Hirschsprung's disease, S J Stabins, J J. Morton, and W J M Scott¹ noted some degree of improvement in 4 cases. Their results were so encouraging that they were led in 1935 to advocate spinal anæsthesia as the proper treatment for the disease. In the same year J. D. Rives and L H. Strug² published 2 immediately successful cases. In England in 1939 E D Telford,³ and E D. Telford and H T. Simmons,⁴ carried the matter further, reporting 7 cases so treated, of which 4 were completely and 3 almost completely cured over periods up to two years after spinal anæsthesia.

Margaret Hawksley<sup>5</sup> has now (1944) published her results in 12 cases, all but one evacuees from the Hospital for Sick Children, Great Ormond Street, in the last three years, and has discussed the whole subject in some detail Considering how little the details of the technique to be adopted were known in the early stages of her work, and the amount of experimental adjustment of them that had to be devised, her results may be taken to be most successful

Technique.—Light percaine, 1-1500, is now used and found to be highly satisfactory. The solution has a specific gravity of 1 0036 as compared with that of cerebrospinal fluid 1 004-1 010, and therefore diffuses to whichever part of the cord is uppermost. This explains why the child is placed in the positions about to be described. The dosage is calculated either as 1 c c. per year age of

patient, or on the Howard Jones formula (designed originally for calculation in adults)  $P = D - 6 \label{eq:patient}$ 

whichever gives the smaller result, this precludes using too much in a puny child. P is the amount of percaine in cc and D is the distance in inches measured from the 7th cervical spine to the intercristal line with the back flexed

The whole technique is as follows No basal narcotic premedication is given, but ephedrine (gr 1) is given intramuscularly just beforehand. The percaine, warmed to blood heat, is injected into the space between the 2nd and 3rd lumbar vertebræ with the child sitting up, and it should take about fifteen to twenty seconds to inject the solution If the child is difficult, and most of them are not if properly managed, a little ethyl chloride is given while the injection is being made and the child is sat up afterwards The child remains sitting for twenty seconds (fifteen seconds in a child under 3 years) and is then placed on its back in the reversed Trendelenburg position, i.e., shoulders highest, this ensures that the bulk of the percaine will affect the anterior roots and will continue to travel upwards This position is usually maintained for five minutes, or until the child complains of pins and needles in its hands, one case did so after two minutes, but this is unusually quick The table is then tilted, bringing the shoulders downwards, thus ensuring that the percaine will not continue to ascend up the cord and thereby menace the cervical region and paralyse the phrenic nerve About twenty minutes or more is required before the full effect is noticed and the characteristic picture obtained, it lasts for about an hour and a half The child appears paler than before, lies quietly, and becomes drowsy, one case became semi-conscious but could just be roused The legs, abdominal muscles, and thoracic muscles are paralysed and breathing is solely diaphragmatic. There is marked loss of tone in the abdominal muscles, which can be pressed right in and only slowly recover their previous position The blood-pressure is raised before the injection by reason of the ephedrine, usually up to 130 mm Hg or thereabouts systolic, and shows some fall, probably to 110 to 120 mm If ephedrine is not given the drop is from normal to well below 100 mm systolic and the child presents an alarming picture of drowsiness and pallor The pulse-rate slows, generally from about 90 to between 60 and 70 beats per minute Visible colonic peristalsis occurs and can be initiated by abdominal palpation. There is anæsthesia up to the nipple line or higher

At this stage a rectal examination should be made, any fæces present removed manually, and an attempt made to feel the pelvirectal junction and assess its degree of spasm. If contracted it should be manually dilated. This is important, Telford states that the achalasia is more commonly at the pelvirectal junction than the anal sphincter

The after-treatment consists in wash-outs on alternate days if no spontaneous bowel action occurs, and liquid paraffin nightly. This régime is discontinued on returning home, with the proviso that a weekly enema may be necessary, depending on the severity of the case

Results.—Summarizing her results in the 12 cases published, the author classes 6 as cured, ranging from 8 years to 9 months since treatment, 3 as improving, ranging from 7 to 8 months, and only 1 as no better—a severe case complicated by a sympathectomy done elsewhere. In the 2 remaining cases not sufficient time has elapsed to judge the results

Studying her series of cases treated by spinal anæsthesia the author lays great emphasis on two of her conclusions. First, that improvement is slow Four weeks was the shortest time in which improvement was definitely established. Occasionally, as in sympathectomy, a motion will be passed on the

operation table, but even this does not ensure a rapid recovery. Secondly, the treatment may have to be repeated, and the author lays down the rule that spinal anæsthesia should be repeated two or three times before the case is judged to be unsuccessful. She adds that apparently the ill-success of the treatment does not necessarily depend on a long history of symptoms, in spite of the possibility of the development of fibrotic changes in cases of long standing as described by J. M. T. Finney.

Rationale of Treatment.—The colon and rectum are innervated by the two antagonistic halves of the autonomic nervous system, the sympathetic inhibiting colonic movements and initiating closure of the sphincters ("filler nerves"), and the parasympathetic initiating intestinal movements and opening the sphincters ("emptying nerves"). The sympathetic nerves concerned originate in the spinal cord from segments T5 to L3 inclusive, and emerge in the corresponding anterior roots the parasympathetic supply derives from the vagus and from the sacral segments 2, 3, and 4. The object, therefore, is to paralyse the anterior roots of the spinal cord up to T5 at least the posterior roots will inevitably be paralysed too, but the success of the injection should be gauged, not so much by the level of the anæsthesia attained, as by the signs of the involvement of the anterior root, muscular paralysis and loss of tone over the abdomen, intercostals, and legs, with some fall of blood-pressure and slowing of the pulse-rate

Telford puts forward tentative suggestions to explain the results obtained by spinal anæsthesia in these colon cases. There is an imbalance between the two halves of the autonomic system with overaction of the sympathetic, and it is suggested that by temporarily paralysing the offending half the parasympathetic can exercise its function unchecked, and that on recovery of the sympathetic the two halves are restored to normal balance. Hawksley concedes that this explanation is by no means convincing, and limits herself to a description of her experiences and results

REFERENCES — Amer J Surg 1935, 27, 107, Med Surg J 1985, 88, 81, Proc R Soc Med 1939, 32, 1145, Brit med J 1989, 2, 1224, Brit J Surg 1944, 81, 245, Trans Amer surg Ass 1908, 26, 475

HIRSUTISM. (See PITUITARY GLAND)

HYDROCEPHALUS, INFANTILE. (See Infantile Hydrocephalus)

HYDRONEPHROSIS. (See Ureter, Surgery of Obstruction at the Pelvi-ureteric Junction)

HYPERTENSION. William Evans, MD, FRCP

Adrenal-sympathetic Syndrome.—R Macketth¹ reported 2 cases of paroxysmal hypertension due to a chromaffin tissue tumour of the adrenal medulla (pheochromocytoma) The paroxysms might be punctuated by palpitation, nausea, dizziness, headache, a rise in blood-pressure, and acute pulmonary cedema. Variable electrocardiographic changes have been found in this syndrome, and among them have been tall, flattened, or inverted T waves

Hypertension in Renal Trauma.—A review of 50 cases with chinical evidence of renal trauma by W F Braason and G. W Strom<sup>2</sup> would indicate that although renal injury may be related to hypertension it is not a common cause. Nephrectomy was performed in 5 cases Hypertension existed in 8 of these cases, and the blood-pressure returned to normal following removal of the kidneys In the other 2 cases the pre-operative blood-pressure was normal

The small number of patients with renal injury who underwent nephrectomy would corroborate the value of conservative treatment. In 38 of 45 cases in which no operation was indicated, the blood-pressure was found to be normal subsequent to renal injury. In 6 of the other cases, the degree of hypertension was moderate and the hypertension either existed before the renal injury or was explained by factors other than renal. Braason and Strom stated that hypertension due to renal trauma usually occurs in cases in which there is secondary renal infection, and this was in keeping with the fact that changes in the renal tissues secondary to chronic infection had been noted in most renal lesions which are known to cause hypertension. When hypertension exists following renal injury it may be difficult to determine whether the injury is an aetiological factor, unless the blood-pressure and other clinical records before the injury are available

Treatment by Sympathectomy.—J Bordley, M Galdston, and W. E Dandy³ have reported on the effects of splanchnicectomy in the treatment of 12 patients with essential hypertension. Ten of them had been observed for three to seven years after the operation, two had died shortly after the operation. The level of the arterial pressure was lowered for 6 to 18 months in 4 of the 9 patients treated by the infradiaphragmatic operation, and for 4½ years in 1 of the 3 treated by the supradiaphragmatic operation. Return of arterial pressure to its pre-operative hypertensive level was not associated with regeneration of the sympathetic nerves

In 13 cases reported by D. Ayman and A. D Goldshine<sup>4</sup> the results were even more disappointing

REFERENCES — Brit Heart J 1944, 6, 1, J Urol 1943, 50, 543, Bull Johns Hopk Hosp 1943, 72, 127, New Engl J Med. 1943, 229, 799

Geoffrey Jefferson, MS, FRCS

In the 1948 Medical Annual (p. 169) an account was given of recent work on vascular hypertension and a commentary made on the sympathectomies that have been devised to counter it It was said then that the most promising results had been obtained by the very extensive operation to which R H Smithwick, of Boston, was finally pressed by lack of success with more limited procedures. The maximal operation now used extends from the sixth thoracic to the third lumbar ganglion on both sides, it is done in two stages operative mortality was 28 per cent. He has now reported the results on . 156 patients followed for from one to five years, one-third of them for three years 1 There were 92 women and 64 men, the average ages of the former 35, of the latter 40 (the age ranges were 10 to 57), they were a selectively young The results have been evaluated by Smithwick on the basis of the drop of the horizontal resting diastolic blood-pressure, it was lowered 30 mm or more in 41 per cent of the cases, 20-30 mm. in a further 20 5 per cent, 10-20 mm. in 179 per cent In 97 per cent the blood-pressure was finally higher than it had originally been. In a comparative study of 100 hypertensives who had major operations other than sympathectomy the results were strongly in favour of the latter group. This is an answer to some who have suggested that any major operation, whatever its nature, on a hypertensive lowers his blood-pressure. It does, of course, but only whilst he is recovering The paper, as a whole, discourages the idea that the effects of the Smithwick operation are very transitory

What are the circumstances under which the better results in some cases are to be expected? Older patients with rigid vessels are not worth operating upon. The duration of hypertension cannot be used as a key because its date of onset is so rarely known, but sex seemed to be important, for the women

did better than the men. Smithwick believes that the best clue to prognosis lies in the width of the pulse-pressure. Those with narrow pulse-pressures, less than half the diastolic, did best, they nearly all had near normal renal clearance test results. The cases that made least improvement were those with a wide pulse-pressure. Sympathectomy had little effect on renal clearance and renal circulation, 20 cases were put through special tests to inquire into this. Abnormalities of the eye grounds were found in most of the patients, it was the nearly invariable rule for them to improve after operation. Smithwick concludes that the good results of the operation are not to be found in improvement in the renal circulation, but are due to decreased peripheral resistance in a wide area of the body—presumably in the abdominal reservoir and lower limbs. No series of hypertensives has been so carefully studied as this, and Smithwick has analysed his results with a truly critical eye. In his hands, at least, the operation is well worth while

REFERENCE -1 Arch Surg 1944, 49, 180

HYPOGLYCÆMIA. Sir Walter Langdon-Brown, M.D, DSc, FRCP. Samuel Leonard Simpson, M.A, M.D, FRCP.

Spontaneous Hypoglycæmia.—S Lups¹ records the case of a man of 28, who, after suffering for nine years from hypoglycæmia attacks, had two adenomas removed from the tail of the pancreas, and made a complete recovery. The special interest of the case lies in the fact that he was treated as a psychiatric patient, undergoing ventriculography, and the cause was not discovered until the attacks became more frequent, and more intense, and a low blood-sugar of 47 mg per cent was found. The attacks might occur at any time, but early morning, before breakfast, was most likely. The patient became tremulous, irrational, disorientated, and often experienced convulsions and coma. At times he imagined while in bed that he was doing other things, e.g., clipping trees with his comrades. A dextrose tolerance test gave the following values.

48, 120, 48, 36, and 36 mg per 100 c.c., and Lups points out that in hepatic hypoglycæmia the tolerance curve is more like a diabetic one.

In functional vagal hypoglycæmia initial blood-sugars may be normal, and the rise of blood-sugar normal, but there is a subsequent fall to hypoglycæmic levels.

Adenomatosis of Islet Cells with Hyperinsulinism.—V K. Frantz² introduces the conception of one or more adenomas as manifestations of general hyperplasia of islet cells. Two patients with hypoglycemic symptoms failed to respond to one or more operations when one or more adenomas were removed, but were eventually cured by extensive pancreatectomy. The condition appears to us to be comparable to that found in the thyroid gland in thyrotoxicosis. In some instances the removal of a single adenoma produces a return to normality, whereas in others a seven-eighths resection of the thyroid gland is necessary, and section of the gland reveals other unsuspected adenomas, as well as areas of hyperplasia.

J T Priestley, M W Comfort, and J Radcliffe<sup>3</sup> performed total pancreatectomy for hyperinsulinism due to an islet-cell adenoma. The patient was a woman of 49 complaining of fainting spells, with dizziness and sweating, sometimes loss of consciousness, the attacks lasting 5 to 60 minutes, and occurring once or twice a day. The history was of 3 years' duration. The attacks were relieved by glucose, and blood-sugar values as low as 29 mg per 900 c.c. were obtained. Since no adenoma of the pancreas could be found at operation, in spite of careful search, complete pancreatectomy was undertaken. Subsequently, a small adenoma,  $8 \times 5 \times 5$  mm. was found in the head of the removed pancreas. Interference with blood-supply necessitated partial gastrectomy and cholecystogastrostomy. Nevertheless, the patient made a

complete recovery, and remained well in spite of a relatively mild diabetes, controlled by 30 units of insulin daily, and some interference with protein and fat digestion. The authors point out that 90 per cent of the pancreas can be removed without diabetes developing. To prevent fatty infiltration of the liver, and hypolipæmia, a diet rich in choline was given, which included 50 g of cottage cheese daily

M S M. Rayner, C H Rogerson, and J. G Jones' record an interesting case of paroxysmal hyperinsulnism which illustrates two points. (1) the diagnosis of a hysterical origin of convulsive fits, with loss of consciousness, should not be too readily made, unless hypoglycæmia has been excluded; and (2) adenoma islets in the head of the pancreas may be missed at operation unless carefully searched for in the duodenal bend

The patient was a woman of 46 with an eighteen months' history of convulsive attacks occurring early morning and before lunch and lasting for half Loss of consciousness was followed by peculiar irrational behaviour, but complete normality between attacks. The initial diagnosis was severe hysteria, and the patient narrowly escaped convulsive therapy Ankle-clonus and extensor plantar response should have excluded functional disorder Several blood-sugars were below 40 mg per 100 cc, and glucose averted or ended an attack At the initial operation the adenoma was missed, and three-quarters of the pancreas removed. Temporary improvement was followed by relapse, and recurrent attacks and a gain of two stone in weight in a few months A second operation revealed an adenoma, 2 cm × 12 cm, in the head of the pancreas It was easily shelled out, and no more hypoglycæmic attacks followed

Subsequent carbohydrate tolerance curves showed a mild diabetes, which has been observed in other cases, and which tends to disappear after months or longer. It is interesting to observe the number of reports concerning hyperinsulinism, once the condition has been recognized, particularly now that its psychical accompaniments are receiving attention.

Alloxan in the Treatment of Insulin-producing Islet-cell Carcinoma of Pancreas. -Since alloxan, the ureide of mesoxalic acid, when injected intravenously in dogs and rabbits, produces necrosis of the islets of Langerhans, A Brunschwig, J. G. Allen, F. M. Owens, and T. F. Thornton<sup>5</sup> felt it was justifiable to try this substance in a man of 32 with hyperinsulinism and a carcinoma of the islets of Langerhans, with metastases in the liver and peritoneum. Five daily intravenous injections of alloxan were given, averaging 5 g daily, dissolved in 500 c c of normal saline Although the blood-sugar value in hospital showed no improvement, averaging 21 mg per 100 cc, hypoglycæmic attacks were less frequent after leaving hospital. He therefore returned and received a total of 280 g of alloxan intravenously in one month, as much as 30 g. being given at one time in 1000 cc of saline The fasting blood-sugar value was raised to 58 mg per 100 cc, and attacks were still less frequent Sclerosis of veins and occasional attacks of chilliness and vomiting followed the injections, so a further laparotomy was performed, but the patient, as might be expected, died

Apart from necrosis of islet cells, no pathological effects in other organs were observed Control injections of alloxan in other patients with metastasizing carcinoma of other organs produced no effect on blood-sugar values

REFERENCES — Acta med scand 1944, 117, 261, Ann Surg 1944, 119, 824, Ibid 211, Lancet, 1948, 2, 476, IJ Amer med Ass 1944, 124, 212

Macdonald Critchley, M D, F R C P
Pathology.—Accounts of immersion foot have been given in the MEDICAL
ANNUAL for 1942, p 187, 1948, p 175, and 1944, pp 122, 161, and 216

# $PLATE \lambda V$

# IMMERSION FOOT

(W Blackwood)



View of feet when dependent, 56 days after exposure, showing gangrene of toes and appearance of reactive hyperæmia in the feet immediately after removal of tourniquet (By couriesy of Professor J R Learmonth)

Plates  $\lambda V$ ,  $\lambda VI$  from the 'British Journal of Surgery'

## PLATE XVI

# IMMERSION FOOT-continued

(W Brackwood)



Fig. 1. Subcutancous vessels, showing n irrowing of lumin of small vein (>60)

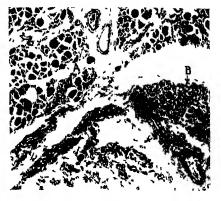


Fig. B. Destensor dinter in the is, showing small well in the tree in its below is [A] and a localized area of reflection in those (B) ( $\times$ 75)



Fig. C —Regenerated motor nerve, lower fibres of flexor hallocis longue, show  $\mathbf{1}_{-}$  if in terminal fibre ese iping from the near entry (A) and passing annivelinited (B), across the muscle fibre ( $\times$  265)



Fig. D - Fibula, showing new bone (darker) which has been laid down sub-periosteally and around Haversian canals ( $\times$  18)

### PLATE XVII

#### INCISIONS IN THE NECK

(E HOLMAN)

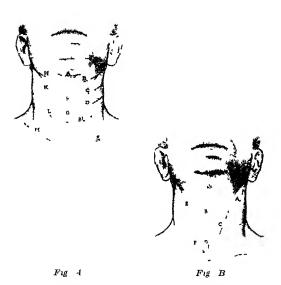


Fig 4—Proper placement of incisions in the neck paralleling the normal lines and folds of the skin A, for drainage of submental abscess, B for excision of congenital sinus partially mobilized through incision B', B' for mobilization of sinus tract presenting at B' but penetrating pharynx at B, C, for excision of carotid tumour or branchial cyst, D, for diverticulum of the cosophagus, E, for scalenotomy or phremic interruption, F, for cricothyreotomy, G, for tracheotomy, H, for drainage of cervical abscess at angle of the jaw, K, for exposure of internal or external carotid, L, for exposure of common carotid, M, for exposure of brachial plexus

Fig B—Placement of incisions as recommended in a recently published text-book (1943) illustrating modern surgical technique, all of which transgress the rule not to cross creases of the skin in the neck. A for excision of a carotid tumour, B, for exposure of the external carotid artery, F, for exposure of the external carotid artery, F, for exposure of the common carotid artery

Reproduced from 'Surgery, Gynecology and Obstetrics'



W Blackwood<sup>1</sup> has recently been able to record the morbid anatomy of this disorder in a series of 14 patients, a view of the feet in one case being shown in *Plate XV* No recent material was available for study, the interval between exposure and removal of specimen ranging from two to twenty-six months

Histological examination revealed that all the tissues in a limb were affected, especially the nerves and muscles Where the initial exposure had not been so severe as entirely to destroy the tissues, regeneration occurred

The changes in the individual structures may be considered in more detail

Arteries —Unlike frost-bite, where obliterative endarteritis develops, the arterial changes in the specimens examined did not differ from those which might be expected in normal 'hard-living' men

Capillaries —No significant changes were seen in the capillaries, but precapillary foci of chronic inflammatory cells were visible in some specimens, taken from patients who had shown either infection or gangrene

Venns—Stasis, with diapedesis, thrombosis, and intimal fibrosis were evident, but usually in areas abutting gangrenous or chronically inflamed extremities (Plate XVI, Fig A)

Muscles — Patchy Zenker's degeneration was seen in the muscles of the leg and foot of a man who had died half an hour before rescue — In specimens taken 4 months or more after exposure, there was a variation in the calibre of the muscles, and other changes, which were associated with and probably due to denervation — Here and there were areas of fibrosis due perhaps to ischæmia, or possibly to muscle tears (Plate XVI, Fig B) — Evidence of remnervation of muscle could be seen at 12 months, and in muscles more distally situated at 26 months

Nerves.—Some degree of degeneration was present in all cases surviving exposure. In severe cases this charge was demonstrable as high as the knee. The late specimens showed evidence of regeneration, with myelination in those axons which had been longest affected (Plate XVI, Fig. C). Fibrosis was present to an extent which might possibly have interfered with further maturation, but Blackwood could not assert whether this process was still active or not

Bone—New bone formation under the periosteum and around the Haversian canals gave evidence of repair of the characteristic initial osteoporosis (Plate XVI, Fig. D)

W Blackwood and H Russell<sup>2</sup> also studied the histology of rats' tails which has been continually immersed in sea water at a temperature of about 4°-5° C for 48-96 hours. No significant injury to the skin and subcutaneous tissue-fic all de detected afterwards, and no vascular thrombosis. The muscles and the nerves proved to be vulnerable tissues. Nerve changes were those of Wallerian degeneration, while the muscle changes resembled the hyaline degeneration known as Zenker's necrosis, and the subsequent picture of aseptic inflammation and repair. The early muscle injury was definitely not the result of denervation. The nerve and muscle changes had not returned to normal in animals destroyed two months after exposure, and in rats surviving for that period there was some evidence of additional muscle changes secondary to denervation. Some of the rats were subjected to a heating-up process after the period of immersion in cold water, though this warming had the effect of accelerating the initial reaction, the end-results after a month were not significantly altered.

Causes of Pain in Immersion Foot.—J C White and Shields Warren<sup>8</sup> have discussed the morbid physiology of the pain in cases of immersion foot. They discriminate clearly between the early burning, throbbing sensations which develop with the onset of hyperæmia, and the aching pain which persists for

so long after the stage of hyperæmia has passed The former type of pain they ascribe to anoxia of the injured superficial tissues and nerve-endings. When the skin is cooled below 80° F the demand for blood on the part of the epithelial and subcutaneous tissue-cells and nerve-endings is reduced and made commensurate with the supply

In the later stages of immersion foot the authors direct attention to the common stiffness of the toes. Biopsy specimens of skin, subcutaneous tissue, and extensor digitorium brevis muscle, removed from 6 patients, have shown extreme fibrosis of the subcutaneous tissue and muscle. The authors believe that compression of the nerve-endings and infiltration of the nerve-trunks by this fibrosis is the explanation of the persistent late pain

This suggestion, possibly adequate to explain tenderness of the tissues of the feet such as is experienced on walking, is not convincing when the *spontaneous* shooting pains which may occur in the late stages are under consideration. Here the usual explanation is that of a painful neuritis associated with nerve-regeneration. The authors believe, however, that incapacitating pains may occur after recovery of the sensory nerves [but this is scarcely likely—M C.]

REFERENCES — Brit J Surg 1944, 31, 329, Edinb med J 1943, 50, 385, War Med 1944, 5, 6

#### INCISIONS IN THE NECK.

Lambert Rogers, M Sc, FRCS.

The tendency for longitudinal incisions in the neck to become keloid is sometimes overlooked, and while few surgeons to-day would use anything but a transverse or collar incision for thyroid operations, it is not uncommon to find, for example, that an incision along the anterior border of the sternomastoid has been made for ligaturing the carotids. This may be described as rather crude surgery Long ago Theodor Kocher, of Berne, drew attention to the importance of cleavage planes in the skin and the desirability of making incisions in these planes and not across them, as is the case with oblique or vertical incisions in the neck. Almost all operations on the neck can be performed through transverse incisions, as Emile Holman<sup>1</sup> has recently reminded us (Plate XVII) In the removal of a branchial fistula, for example, which opens just above the clavicle and extends upwards to enter the pharynx in the tonsillar region, adequate exposure can be obtained through two transverse incisions made in crease lines or placed parallel to these The remarkable way in which transverse cervical incisions heal, so that in a few weeks or months the majority are quite inconspicuous, is well known, and to be contrasted with the ugly appearance so often presented by vertical or oblique scars. In women particularly care should be taken to use only transverse incisions placed whenever possible in a crease line The divided platysma should be accurately approximated with interrupted fine silk sutures and the skin wound closed with clips which are removed in 24 or at the latest 48 hours, a frequent practice in goitre operations, the scars of which are notoriously inconspicuous

REFERENCE - Surg Gynec Obstet 1944, 78, 533

# INFANTILE HYDROCEPHALUS AND SUBDURAL HÆMATOMA.

Geoffrey Jefferson, MS, FRCS

Gradual enlargement of a baby's head has always been regarded as being sure evidence of internal hydrocephalus, and this opinion has been right in the vast majority of cases. However, F. D. Ingraham and D. D. Matson,' in an important paper, drew the pædiatrist's attention to another cause, a more curable one, namely, subdural hæmatoma. The correct diagnosis can only be arrived at by puncture, but the technique of this is so simple a step that it is

within the competence of anyone accustomed to use a Record syringe. course, subdural hæmatoma is a well-recognized condition in adults, familiar to the neurologist as the cause of mental disturbance after head injuries, but probably still not so well known to the practitioner as it might be in spite of all that has been written these last ten years and more. The doctor needs to have had a case of his own verified by operation before his eyes are fully opened to a pathological entity It could scarcely be otherwise. Few cases have hitherto been reported in infants, but here come Ingraham and Matson with a big series, no less than 98 cases in the years 1937-43, from one hospital, the Boston Children's Hospital They remark that prior to 1937 the number of cases diagnosed yearly was 2 or 3, whilst in 1941 there were 25—say 2 a month Ingraham and Matson do not believe that the condition is becoming any commoner, the increased number depends on a heightened awareness of the possibility of this condition, consequently those more active steps that lead to diagnosis are more frequently taken In half the cases there was a history of mjury to the head, 28 were known to have had severe trauma at birth (a causal agency that they believe to be understated by that figure) Radiographs were taken of the heads of all, but only 11 fractures were seen majority of the patients were males, and most were under 6 months of age; over 12 months there were very few indeed, and none were over 2 years old. The clinical picture is most important. This will sound paradoxical when it is added at once that it is the authors' opinion that there is no clinical syndrome which is in any way characteristic. They believe that failure to gain in weight, that fever, vomiting, and irritability, are symptoms very often attributable to a cerebral cause in infancy, no less than the more obviously neurologically derived signs of coma, headache, convulsion, and paralysis. The commonest were convulsions (56 per cent), vomiting (47 5 per cent), and irritability (36 5 per cent), but, they say, these are characteristic of many other diseases in the same age group, whilst the coexistence of infection in a high percentage was another misleading factor (pulmonary, gastro-intestinal, or urmary pyrexia on admission) Ingraham and Matson declare that the most constant neurological signs are increased muscle tonus, hyperactive reflexes and ankle-clonus, the extremities may be rigid. Only 28 of the patients were noted at the time of admission to have hydrocephalus, but, they say, "enlarged head" could be a better designation. The head never reaches the very large size attained by the worst hydrocephalics, though, to be sure, that largely depends on the length of survival From some of the photographs that illustrate the article it can be seen that some of the heads were very noticeably large

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To sum up and to give something more solid for the clinician the following is the most characteristic triad (1) Failure to gain weight, refusal of feeds, irritability, abnormal temperature swings, (2) Accelerated increase in the size of the head, (3) A history of difficult labour But only about a quarter of the cases run true to this picture, and it is only especially characteristic of the first post-natal month

Diagnosis can only be made by careful puncture under local anæsthesia through the lateral wings of the anterior fontanelle. Grossly bloody or yellow fluid is found at once when the diagnosis is positive. The puncture of the dura can be recognized by touch, the needle should not then be advanced any further. The distribution of these fluid hæmatomas is anterior and lateral rather than posterior, usually the condition is bilateral. The taps have to be repeated daily, 10–15 c.c. being removed from each side. After two weeks bilateral temporal trephine holes are made to see if there is a membrane enclosing the clot and a flap is turned to remove it if it is present. This

exceedingly important paper, which is fully illustrated with clinical and coloured photographs, must be consulted for the operative detail. The most important thing at this stage is to make the condition known. Judging by the Boston figures dozens of these cases must be admitted yearly to the combined children's hospitals of a county of any size.

REFERENCE -1J Pediat 1944, 24, 1

#### INFLUENZA.

Thomas Anderson, MD, FRCPEd

Epidemiology.—A moderate epidemic of influenza occurred in Great Britain during the last three months of 1943. As a result, the deaths in England and Wales from this infection (12,616) were more than three times those recorded in 1942. The bacteriology is described in some of the following extracts

Clinical and Laboratory Studies.—J M Stansfeld and C H Stuart-Harris² report an outbreak of influenza B during 1942—43 Sera were removed from 67 patients during the acute and convalescent stage of their illness, in 26 no increase in antibody titre was shown by the Hirst technique, in 6 the increase was two- to three-fold, and in 35 the increase was four-fold against virus B All were negative against virus A The signs and symptoms noted in 24 of these cases of virus B infection and 12 of the cases which failed to show a significant rise in titre were compared with those of 60 cases noted during 1937—41 the authors failed to demonstrate clinically distinguishable differences

C H. Stuart-Harris and R E Glovers have continued their studies of laboratory material from suspected cases of influenza Previous experience had suggested that 1941 would be an 'influenza year', but although sera from 52 sporadic cases were examined during 1941-42 they found no evidence of infection with a known virus type (They have confirmed that the Hirst serum test (see MEDICAL ANNUAL, 1943) applied to the acute and convalescent serum of suspected cases is a more delicate index of infection than ferret inoculation, especially in virus B outbreaks ) A mild increase of cases in the beginning of 1948 was due to virus B, but later in the year virus A was encountered in several minor epidemics in different parts of the country. These latter epidemics showed no tendency to spread Attempts to isolate virus B were unsuccessful, but the authors found that the application of the Hirst technique to ferret serum might be of value in assessing inapparent infection in this animal In 6 cases in which examination of the patients' sera had suggested infection, a significant rise in titre against virus B was also found in the sera of inoculated ferrets.

During April and May, 1943, an epidemic involving 68 cases occurred in an Air Force establishment in Britain which was thought to be due to virus A Four out of six sera (taken in duplicate, during acute and convalescent stage) were examined against virus A and B — rises in titre (from six- to sixteen-fold) were only noted against A — T H Donnelly et al 4 describe this outbreak, which had two well-marked peaks and probably attacked in a mild form a very much larger number of persons — The clinical form of the disease was not severe and most patients were fully fit seven days after leaving bed.

C H Andrewes and R E Glover<sup>5</sup> record that the epidemic of influenza in the last quarter of 1943, due to virus A, was the most widespread in Britain since 1987 Serological tests early in 1943 showed that a small amount of virus B infection was about, during April-September virus B was replaced by a small number of isolated outbreaks due to virus A (see above)

From the main outbreaks (after September) the sera of 60 patients in different parts of England were examined in duplicate a four-fold increase in antibody titre against virus A was noted in 72 per cent. Ferret inoculation of unfiltered

garglings from 24 patients was successful in 14 (58 per cent—a higher proportion than has been possible since 1987). Only two of nine strains could be adapted to mice from ferret material (after three passages) and were found to be closely related to two of the standard A strains. Although filtrates of garglings failed to infect developing eggs, in one instance filtrate of material from a ferret was adapted to eggs. It is interesting to note that influenza of a similar type—predominantly A—was also prevalent in the United States in the autumn of 1948 (see below). [Last year reference was made in the Annual to Andrewes' conception of different 'grades' of influenza virus which postulated that there was an association between the ability of the virus to spread widely in the community and its capacity to infect laboratory animals. The findings above in regard to ferrets would support this, but the negative results in mouse-adaptation are not in keeping—T A ]

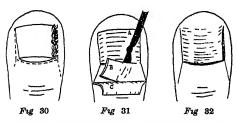
J M Adams et al 6 describe an epidemic in the pædiatric wards of an American hospital. The outbreak lasted about one month (Nov-Dec, 1943) and is particularly interesting in that 15 of the 24 patients were under 3 years of age. The last epidemic of virus A influenza had occurred during 1940–41, so that it might be assumed that many of the children were making their first acquaintance with virus A. Acute and convalescent sera were examined from 23 cases against the PR8 and Lee strains of A virus, 18 (78 per cent) showed a four-fold or greater increase in antibodies for virus A. Seven of 19 throat washings, examined for the presence of virus by inoculation intra-allantoically on developing eggs, were found to be positive. The pre-infection titre of antibody in those children under 2 years was much lower than in those over 3 years of age, but the average rise in the younger subjects may perhaps have been greater.

REFERENCES —  $^1Rep$  Mm Hith 1944,  $^3Lancet$ , 1943, 2, 789,  $^3Ibnd$  790,  $^4Bru$  med J 1944, 1, 42,  $^5Lancet$ , 1944, 2, 104,  $^4J$  Amer med Ass 1944, 125, 473

#### INGROWING TOE-NAIL.

Lambert Rogers, M Sc, FRCS

Treatment of this condition was last discussed in the Medical Annual, 1988, p 263 Captain T E Wilson, of the Australian Army Medical Corps, has reported his experiences of it among troops, in whom it can be a very troublesome disability Ingrowing toe-nail occurs most often on the medial side of the great toe, less often on the lateral side Only very infrequently are other toes involved It is the result of an overgrowth of infected paronychium around the nail edge, the pressure of which causes necrosis with the "That as humble a condiformation of granulation tissue Wilson writes tion as ingrowing toe-nail should have such a variety of operations described for its cure suggests that many or all of these operations have various disadvantages and that a permanent cure by any method is not easy. high recurrence rate following removal of the granulations and hypertrophied cellular tissues or the avulsion of the whole or part of the nail is sufficient to exclude them as useful procedures" After discussing the disadvantages of certain of the more commonly practised operations, he gives the details of the operation which he has found satisfactory in soldiers. The steps of the operation can be followed from the accompanying figures (Figs. 30-32) Infection should be controlled before operation by eusol baths and dressings The anæsthetic is either procaine, 2 per cent, which is infiltrated around the base of the toe, or sodium pentothal intravenously. Incisions are made as shown in the diagram, the nail is avulsed and its matrix dissected away, the wound dusted with sulphanilamide, and the flaps are allowed to fall into place and kept in position by a firmly applied vaseline dressing. The dressing is left on for 10 days Wilson has performed the operation 36 times without recurrence or complications The patients were in hospital for 3 weeks or longer, but on healing being complete returned to full duty. This rather radical operation appears to have justified itself in the case of troops, in whom the condition is often particularly troublesome and infection well established. In those, however, in whom the condition is not as advanced, the less radical procedures described in the Medical Annual for 1938 may be remarkably effective, and most will prefer to give them a trial before resorting to such



Figs 30-32—Steps in the treatment of ingrowing toe-nail A, Uncovered sterile matrix, B, Matrix of nail root being dissected up, C, Flap of eponychium turned back (Reproduced from 'The Medical Journal of Australia')

radical surgery Writing of these lesser measures, Wing Commander A. Ronald² advocates what he describes as the most effective and simplest—namely, packing under the nail edge with cotton-wool or tin-foil W. F Cooper³ also supports the very simple procedure of filing the middle part of the nail almost to the bed, a method which he has found painless and efficient. Nails are best filed when dry and cold, but best cut when wet and as hot as possible.

Prophylaxis is all important, particularly among troops and others on the march and this consists in the wearing of properly fitting socks and footwear and the cutting of the nails square

References -1 Med J Aust 1944, 2, 88, 2 Brit med J. 1944, 2, 520, 2 Ibid

## INTESTINES, SURGERY OF. (See also DUODENUM, CARCINOMA OF.)

A Rendle Short, M.D., F.R.C.S.

Regional Ileitis.—J. W Holloway, of Cleveland, reports 18 personal cases, arranged to illustrate the multiform clinical variations of the symptoms in this disease (*Plate XVIII*) In the acute phase, the differential diagnosis from appendicitis is not possible, even with the help of a barium meal. In the chronic form, the so-called "string sign", shown by X rays, is practically diagnostic. In his opinion, acute regional ileitis will probably settle down, and resection is not indicated. In the chronic cases, short-circuiting or resection will be the best treatment.

Tumours of the Small Intestine.—Severe intestinal hæmorrhage may be due to a myomatous tumour of the jejunum. G Gordon Taylor<sup>2</sup> relates two examples of this uncommon condition. One of the patients died. These tumours are not easy to demonstrate after giving barium, and a thorough search is necessary to find them at operation.

Almost every year a paper or two is published describing a short series of cases of *lymphosarcoma* of the alimentary tract. Twenty patients suffering from this disease were treated in New York Hospital (B. McSwain and J. M Beal<sup>3</sup>) Diagnosis is difficult. Treatment may be excision followed by radiotherapy, or by radiotherapy alone. Of 19 cases followed up, 8 recurred and died

## PLATE XVIII

## REGIONAL ILEITIS

(J W HOLLOWAY)



Fig. A —Drawing of operative findings Primarily lymphatic block, characterized by cedema, and peritoneal fluid, but with no other signs of inflammation Classified as acute regional ileits upon basis of history and findings



Fig. B—Drawing of resected specimen. Little evidence of lymphatic block, lesion of obvious chronicity, with fibrotic changes constituting a definite tumour

Reproduced from the 'Annals of Surgery



## PLATE XIX

## ILEAC ANASTOMOSIS

(C Drn\is)

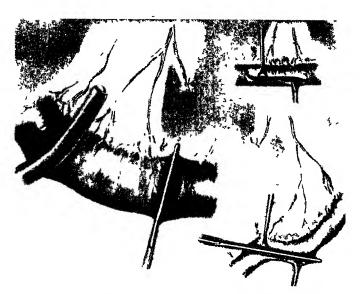


Fig A

Figs B, C (above)

Fig 4—Placement of the first anastomosis clamp on the distended bowel above the point of obstruction —The clamp crosses the bowel at an angle of 75°, and at the mesenteric border about 6 mm from the edge of the unremoved mesentery —The bowel has been milked back and a rubber-shod clamp is applied to prevent spillage

Fig. B.—Placement of the second anastomosis clamp on the contracted bowel below the point of obstruction. The line of crush begins 6 mm from the unremoved mesentery, crosses obliquely two-thirds of the bowel and passes for a distance parallel with the antimesenteric border before crossing the remaining one-third of the bowel (Fig. C). This length of crushed trisue, equal to that in Fig. 4, is obtained by distorting the bowel with Allis forceps. This clamp is placed from the mesenteric border.

Plates \II \ \Lambda \ reproduced from 'Surgery Gynecology and Obstetrics'

## PLATE XX

# ILEAC ANASTOMOSIS-continued

(C DENNIS)



Fig. D—Cutting the bowel between the clamps described in Fig. 1 and Fig. B with the cuttery. To prevent spillage addition if clamps are placed between those applied for anastomosis and the specimen to be removed.

Fig. E.—Placement of the posterior running fine catgut suture. The clamps are held side by side, so that the bowel ends are brought together with 180° rotation of one with respect to the other. The suture is laid with the clamps rolled away from each other as shown. The bitts are 5 mm long and the gaps between bitts are 4 mm.

Fig. F.—Placement of each end bite parallel with the long ixis of the gut issures good inversion later

Diverticula of Jejunum and Ileum.—Apart from the well-known Meckel's diverticulum, these are not very uncommon. At the Mayo Clinic, according to C F Dixon and J M. Waugh, 122 cases were seen in thirty-three years. They may give rise to acute intestinal obstruction, or gangrene and perforation, or melena. The walls of a diverticulum are very thin and fragile. They are better treated by short-circuiting than by resection. [The only case I remember treating was a woman of 48 with acute diverticulities of the jejunum. She had often had attacks of severe abdominal pain. Several inches of jejunum were resected. A year later patient was very well. Some gall-stones were removed from her gall-bladder.—A R. S.]

Intestinal Anastomosis.—C Dennis, of Minneapolis, describes and illustrates a method of end-to-end anastomosis of the ileum by an oblique, aseptic method, specially suitable when the proximal gut is distended and the distal collapsed, as a result of obstruction. The distal segment of the bowel is cut very obliquely indeed, so as to equalize the size of the open ends. The gut is rotated, so that the anti-mesenteric border is sutured to the mesenteric border. Late stricturing does not occur. (Plates XIX, XX)

REFERENCES -1Ann Surg 1943, 113, 329, \*Brit. J Surg 1944, 31, 266, \*Ann Surg 1944, 119, 108, \*Ibid 1943, 118, 377, \*Surg Gynec Obstet 1943, 77, 225

# INTRA-OCULAR FOREIGN BODIES.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

The casualties of war, both Service and civilian, have recently brought the subject of intra-ocular foreign bodies into the foreground. In normal times industry, particularly metal work and the engineering trades, supplies a fairly constant stream of these unpleasant accidents, but with the war their numbers have recently increased, and, unfortunately, their nature has altered in so far as a large proportion of modern missiles are composed of alloys with a low ferrous content and therefore a low degree of magnetism, so that their extraction in the ordinary way by a magnet is frequently a matter of considerable difficulty or may even be impossible

Several papers have appeared on this subject during the last year which it is of interest to review. One by Dansey-Browning¹ (1944) deals with the treatment of foreign bodies in advanced Ophthalmological Units in the Field, a second by Stallard² (1944) in Base Hospitals abroad, and a third by Trevor-Roper² (1944) at home at Moorfields Hospital. In the first paper 67 cases of intra-ocular foreign bodies are reviewed, in the second 102 cases, and in the third 154 cases. One point brought out by Stallard, working in the Middle East, is the advisability of extraction by the posterior route, whereas in the last war the consensus of opinion definitely favoured the anterior route. Stallard gives three reasons for this—

- 1. The war missile foreign bodies are so lowly magnetic that they are not brought forward by the anterior route technique of using the giant electromagnet. Indeed, in a routine preliminary test with the magnet before operation, only one in this series gave a positive response. Had the operator been satisfied with this test 20 war missiles in the series would not have been extracted. All these were delivered from the eye by the giant magnet through the posterior route
- 2. The posterior route allows access to the sclera at some site of election. In principle this should be as near to the foreign body as possible. In this series it was never necessary to make the scleral incision behind the equator and, indeed, such is probably undesirable on account of the greater technical difficulty of accur te scleral suturing than is the case between the equator and the ora serrata. Also the thin sector of visual field defect owing to surface

diathermy might be appreciated subjectively, whereas when sclerotomy is pre-equatorial this passes unnoticed by the patient

3. Extraction of ragged-edged and rough-surfaced foreign bodies by the posterior route inflicts less damage on the eye The dragging of such a foreign body over the ciliary processes, through the suspensory ligament, and then between the iris and lens capsule would inevitably hurt these structures seriously The removal of any foreign body over 3 mm in size by the anterior route risks iris entanglement and the unpleasant complications which follow this

In addition to this a preliminary light surface coagulation of the sclera by diathermy at the site of election of the incision—usually just behind the ora—reduces the immediate danger of intra-ocular hæmorrhage and the ultimate danger of retinal detachment by sealing the retina down to the choroid in the subsequent scarring around the incision, just in the same way as a retinal hole is sealed off in the operation for detachment of the retina

The technique suggested is as follows At the site of election for the incision a tongue-shaped flap of conjunctiva, episcleral tissue, and Tenon's capsule is reflected backwards to lay bare the sclera and is held back by sutures. The eye is rotated and immobilized by a suture attached to the appropriate rectus Surface diathermy is now applied to the sclera at the site chosen for sclerotomy, one or two applications being all that is usually necessary The sclera is now incised with a Bard-Parker knife in the anteroposterior axis of the eye in the diathermized area for about two-thirds of its thickness, the incision being about 1 mm larger than the size of the foreign body as estimated radiographically Then while the sclera is steadied by two hooks, a mattress suture of 000 silk is passed above and below the scleral incision The lips of the scleral incision are now held apart by the two hooks and the incision completed down to the sclera The position of the head and eye is then adjusted so that the scleral wound lies uppermost to prevent the escape of vitreous, the choroid is incised with a Graefe knife throughout the length of the incision, and the magnet point is placed inside the wound and the current turned on In some cases when the foreign body is feebly magnetic several attempts must be made before it attaches itself to the terminal of the magnet Thereafter the magnet is removed, the scleral suture tied, and the conjunctival flap reposed

Unfortunately, long after-histories of extraction by the posterior route using this technique are not yet available in numbers. Using the anterior route, when the foreign body is coaxed round the ciliary body into the anterior chamber and removed from thence by a small magnet through a keratome incision, Trevor-Roper's reports of a follow-up of the cases treated at Moorfields during the war is of interest. They may be summarized thus—

#### RESULTANT VISION

	Good (6/5-6/9)	Moderate (6/12-6/60)	<i>Bad</i> ( <b>&lt;</b> 6/60)	Excision
1 With lens undamaged 2 With lens damaged Of total by anterior route	per cent 65 13 30	per cent 20 20 20 20	per cent 15 40 32	per cent 0 27 18

Some factors determining the resultant vision are of interest -

- 1 Damage to the lens gravely affected the prognosis, as is seen in the foregoing table, two-thirds of those with lens undamaged attaining good vision (6 9 or better), and two-thirds with lens damaged attaining bad vision only (less than 6/60)
- 2 The amount of uveal damage was of considerable importance in determining the amount of permanent visual loss, the resulting vision being very

much less in the presence of holes and tears of the iris, traumatic hyphæma, iris or cihary prolapse, hypopyon, iritis, or gross synechiæ

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3. Delay in removal of the intra-ocular foreign body did not seem materially to prejudice the issue, although in two cases siderosis was evident which could have been averted. This is made clear by the fact that the proportion of cases that attained good or moderate vision to those with bad vision remains constant irrespective of delay. Excisions were, in fact, relatively more frequent in those cases reaching hospital early, but this may be explained by the fact that the more severe injuries with the worse prognosis would demand hospital attention more urgently. The lack of prognostic importance attached to delay in removing the foreign body is of great interest in the treatment of war wounds: it is much wiser to wait, even although it may be for a week or two, until the best conditions for operating are obtainable than to attempt operation in unfavourable surroundings

The removal of non-magnetic foreign bodies is a more difficult matter, but one or two cases have been reported by military surgeons wherein, after accurate localization, the foreign body has been cut down upon through a scleral flap and has been removed directly by forceps or a snare. Such cases, however, are rare and their success is attended by an element of luck. One such case has been recorded by Pierse<sup>4</sup> (1943) in which a foreign body of brass was removed from the ciliary region, while O'Hea-Cussen<sup>5</sup> (1944) successfully removed a small piece of stone from the vitreous through a scleral incision by means of a curette, the resultant vision being 6/18. Further reports of such cases are made by Stieren<sup>6</sup> (1943)

When the posterior approach is attempted accurate localization of the foreign body is essential. There are several well-known radiological techniques for this, not the least useful of which, particularly when elaborate apparatus is not available, is localization with respect to a metal ring sewn to the limbus, pictures being taken in different positions of the eye. A new idea, however, has been introduced in America in the shape of the *Berman locator*. It was used with great effect by Moorhead (1943) in the holocaust at Pearl Harbour, and has been advocated by Minky (1944).

In a diagnostic rod is placed The locator operates in the following way the equivalent of two transformers—one in the handle and the other at the tip, which is used to search for the foreign body The primary coils are connected m series to a source of alternating current Also in series, the secondary coils are connected through an amplifying unit to a voltmeter When an alternating current is sent through the primary coils, a current is produced in the secondary coils by induction The instrument has a means of equalizing (balancing out) the voltages in the secondary coils so that the needle of the voltmeter will read approximately zero, since no current flows between them Now, if the coil in the tip of the rod approaches a magnetic metal (the foreign body), the balanced inductance is disturbed and a difference in potential takes place in the secondary circuit, which results in a flow of current amount of this current, shown by the deflection of the needle in the voltmeter, varies with the size of the metallic particle and with its distance from the tip At the point of greatest deflection, therefore, the tip of the locator is immediately over the foreign body Conversely, as the locator travels away from the foreign body, the deflection of the needle is lessened. One can estimate the depth of a foreign body, in addition, if its size and composition are known, by determining the distance necessary to give the same reading, with the controls unchanged, in approaching a similar piece of metal The instrument responds best to iron and steel, and less effectively to copper, brass, silver, aluminium, lead, and their combinations The differentiation of a non-magnetic foreign body from a magnetic one is easily made when the needle of the voltmeter does not move at all

REFERENCES — Brut J Ophthal 1944, 28, 87, \*Ibid 105, \*Ibid 361, \*Ibid 1943, 27, 550, \*Ibid 1944, 28, 296, \*J Amer med Ass 1948, 123, 880, \*Ibid, 121, 123, \*Arch Ophthal, NY 1944, 31, 207

INTRAPERITONEAL CHEMOTHERAPY. A. Rendle Short, MD, FRCSNaturally, there has been a good deal of interest in, and investigation of, this subject [War experience in North Africa and the Italian campaign is

referred to elsewhere (see Abdomen, Injuries of)

In dogs, sulphathiazole causes too many adhesions, and a saturated solution of sulphanilamide in saline was preferable, especially combined with heparin (F. Boys and E P. Lehman 1)

R H. Gardmer,<sup>2</sup> of Aylesbury, remarks that the powder should be sterilized, as a case of tetanus has been reported after intraperitoneal use. Either a powder may be dusted around an intestinal anastomosis, or a fluid suspension of 10 to 15 g of the powder in 6 to 8 oz. of sterile saline may by squirted in with a syringe. He used sulphapyridine for the most part. His patients were suffering from appendicitis, intestinal obstruction, or pelvic abscess. Improved results are claimed.

R. F Matters,<sup>3</sup> of the Australian Navy, writes to much the same effect. He used powdered sulphanilamide His patients were all gynæcological

T J Anglem and Howard Clute, 4 of Boston, have applied sulphanilamide powder to the suture line in 75 resection cases, mostly gastric. They consider that if less than 8 g is used the danger of toxic reactions is small, but their normal quantity has been 6 to 8 g. There were no deaths from pentonitis, though there was peritoneal infection in one case, and symptoms of toxic hepatitis developed in another, followed by recovery. Sulphonamide should not be given by the mouth as well

REFERENCES — Ann Surg 1943, 118, 612, \*Brit J Surg 1944, 32, 44, \*Med J 4ust 1943, 2, 85, \*New Engl J Med 1948, 229, 482

KALA-AZAR. Sir Philip Manson-Bahr, C M G, D S O, M D, F R C P Treatment with Sulbamidne.—R B U Somers¹ has during the last eight years treated 26 cases of kala-azar in the Sudan Of these, the first 21 were treated with antimony tartrate or neostibosan, and these patients either died in hospital or ran away, but the last five were treated with stilbamidine, and all responded favourably Stilbamidine was injected intravenously at intervals of one to three days. The initial dosage was 1 1 mg. per kilo body-weight, and this dose was increased gradually to 3 5-4 0 mg per kilo.

The first patient had received four courses of sodium antimony tartratea total of 175 gr.—without provoking any response He was then given during 53 days a course of stilbamidine (287 g.), followed four months later by a second course (1-32 g) The second was complicated by severe scorbutic and septic complications of the mouth, but these responded to ascorbic acid and sulphapyridine Two courses of stilbamidine (2 23 and 0 78 g ) were given with an interval of about one month The third patient, previously treated with anthomaline, was given two courses of stilbamidine (2 48 and 1 6 g ) with an interval of three months; the fourth, previously treated with sodium antimony tartrate, two courses of stilbamidine with an interval of three weeks The fifth, who had already received three courses of 15 daily injections of 50 mg of stilbamidine with intervals of nine days, relapsed one month after the last course. In spite of this he was dangerously ill and had a large buccal ulcer and parotitis which were cured with sulphapyridine and vitamin C was then given a course of 31 injections of stilbamidine (4 35 g.) Since then he has been in good health It is concluded that six months of continued improvement may be taken as a criterion of cure Reactions were breathlessness, headache, dizziness, vomiting, and epistaxis

A Neuropathic Sequel of Stilbamidine Therapy—In earlier communications by Napier and Sen Gupta<sup>2</sup> it was stated that, though the rate of cure with this drug was estimated at about 98 per cent, two drawbacks were noted first immediate reaction might be of some severity, and though alarming, could be controlled by injections of adrenaline, but the second was of a neuropathic type A further 10 cases of this sequel have now been noted neuropathic symptoms, which are confined almost entirely to the face, become apparent three to four months after completion of the course of treatment, nor was any evidence obtainable that they were in any way related to the amount of stilbamidine injected Salient symptoms were (1) subjective sensory disturbances—paræsthesia and anæsthesia over the parts supplied by the trigeminal nerve, (2) dissociated anæsthesia with loss of sensation to light touch over various portions of the trigeminal nerve It is concluded that the lesions in these cases are situated in the principal sensory nucleus of the fifth nerve in the pons, and probably represent a toxic degeneration, as trichlorethylene inhalations may give rise to bilateral loss of sensation in the trigeminal area, it is suggested that it is the ethylene component of stilbamidine which is the cause of the trouble, but the condition is not dangerous and has a tendency to slow recovery

Treatment with Solusthosan.—Gil Bermudez³ describes the successful treatment in Spain of 15 cases of infantile kala-azar (6 months to 9 years) with solustibosan in concentrated aqueous or oily suspension. The watery solution is four times the usual strength 1 c c representing 0 l g of pentavalent antimony, whilst the oily suspension is such that 1 c.c represents 0 054 g of pentavalent antimony. The concentrated watery solution was administered intramuscularly in daily doses for ten days, the full course being 1 c c per kilo body-weight. In some this did not effect a cure, so it was followed up by six intramuscular injections of the oily suspension on alternate days—the total quantity representing 2 c c for each kilo body-weight. In some a single course of the oily suspension sufficed, whilst in others two such courses were required. Both preparations were of low toxicity and well tolerated. In certain cases blood transfusion was indicated. In most vitamin C and liver extract were administered as adjuvants.

It is concluded that the oily suspension of solustibosan marks an advance in the therapeutics of infantile kala-azar

REFERENCES — Lancet, 1944, 1, 581, Indian med Gaz 1943, 78, 537, Med esp 1943, 56, 301.

KERATITIS, MUSTARD-GAS. (See CORNEA, DISEASES OF)

KIDNEYS. (See also Renal Diseases)

KIDNEYS, SURGERY OF. (See also Anuria, Pyelography)
Hamilton Bailey, FRCS.

Pseudo-hæmaturia due to Beetroot.—A E Roche¹ does well in directing the attention of the profession to pseudo-hæmaturia after eating beetroot. This pseudo-hæmaturia comes on about four hours after ingesting a large quantity of beetroot, and has entrapped the very elect. The patient remains perfectly well, but the urine, and later the fæces, may be coloured red. The urine contains no clots or sediment. It has a peculiar purplish colour, which Roche likens to cherry brandy. In order to clear up the diagnosis, if alkali is added to the urine it becomes yellow, and red again on adding hydrochloric acid.

Urmary Sediment due to Indigocarmine.—H L Douglas and C G Ransom<sup>2</sup> have shown in a large series of cases that indigocarmine, as used for renal function tests, causes an abnormal urmary sediment, together with blue renal casts, which may be mistaken for pathological conditions

Congenital Abnormalities.—O S Lowsley and J H Menning<sup>3</sup> have reviewed the literature of a solitary kidney situated at the brim of the bony pelvis. In their case the junction of the ureter was obstructed and re-implantation of the ureter into the bladder was performed, together with nephropexy. [Solitary pelvic kidneys are very prone to become infected owing to obstruction to their ureter; I have encountered such a case. To show that solitary kidneys in a normal position are not uncommon, three cases of total absence of one kidney, together with its ureter, have come to my notice this year—H B]

Congenital Cystic Kidneys.—J. A Lazarus<sup>4</sup> finds that about 30 per cent of patients with congenital cystic kidneys succumb within 2 years of the onset of symptoms, 15 per cent live for 2–4 years, while the remaining 55 per cent live for more than 5 years. To retard the recurrence of cysts following Rovsing's operation, Lazarus recommends periodic ureteral dilatation and pelvic lavage, with a view to lessening intrarenal tension

W F Braasch and J A Hendrick<sup>5</sup> do not approve of the term 'solitary renal cyst' Although one cyst is usually the cause of the symptoms, there

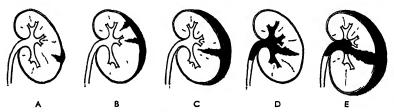


Fig 33.—Various types of renal injuries A, Small subcapsular hæmorrhage, B, Large subcapsular hæmorrhage, C, Cortical laceration with perinephnic hæmatoma, D, Medullary laceration with bleeding into the renal pelvis, E, Complete rupture (After P Adams)

are frequently other smaller cysts in the kidney. They prefer the term 'simple renal cysts'. Simple renal cysts are unilateral, and are definitely a disease of adult life. In 75 per cent of cases the average age is nearly fifty years of age. This condition has been frequently mistaken for polycystic kidney, and cases have been cited as examples of 'unilateral polycystic disease', a condition which, in their opinion, does not exist

Injuries.—P Adams<sup>6</sup> depicts the various types of renal injuries (Fig 33) Serious renal injuries are sometimes overlooked, mainly for want of examining a specimen of urine after an accident. A concussed patient is one obvious type of case where this omission is made. One should realize that the symptoms may be extraordinarily few. For instance, a patient fell in a bunker of the seventh hole. He played the eighth and minth holes before returning to the club-house to pass urine, which he noticed contained blood. He had a seriously ruptured kidney. Many of the patients with these injuries continue their work or play for some hours before seeking advice.

Spontaneous Rupture.—F G Irwin' records a case of spontaneous rupture of the kidney in a U S gunner's mate, aged 25, who had enjoyed perfect health until he was awakened from his sleep 2½ hours before admission. On laparotomy the peritoneum, which was opened on the diagnosis of perforated peptic ulcer, was full of blood. The right kidney was found to be the source of the hæmorrhage, and later examination showed a rupture of the cortex 8 cm in length

C P Mathé<sup>8</sup> points out that spontaneous rupture occurs in kidneys which have been weakened by chronic nephritis, stone formation, tuberculosis, tumour, infarct, pyelonephritis, or aneurysm. In Irwin's case chronic pyelonephritis was present. Mathé reported 5 cases, 4 of which occurred in patients with hydronephrosis secondary to an impacted stone in the pelvis

Severe Renal Infection.—Basing their conclusions on 100 cases of acute urmary infections, which include cortical lesions and pyelonephritis where the temperature has remained at 103 5° or more, in spite of conservative measures, including chemotherapy, J. Duff et al 9 emphasize the importance of resorting to operation without further delay They have found ureteral catheterization and drainage inadequate. It is only when the kidney has been exposed that Because of the frequent involvethe nature of the operation can be formulated ment of both kidneys, preservation of renal tissue is desirable, but such conservation is permissible only if it is considered that the patient is able to withstand a stormy convalescence, which must be expected when a seriously infected kidney is not removed. In over 40 per cent of their cases, the functional integrity of the opposite kidney having been ascertained beforehand, nephrectomy was considered advisable The next most useful procedure was found to be decapsulation, together with, when the outflow of urine down the ureter was obstructed, an ample pyelostomy No attempt was made to intubate the renal pelvis, but free drainage of the perirenal tissues was pro-Nephrostomy was not found satisfactory when performed upon a kidney with a thick, congested cortex, in their opinion, it should be reserved for cases where the cortex has been thinned out by earlier obstructive changes Following these principles. 90 per cent of the patients recovered [Taking into consideration that all of the patients were desperately ill and many of them aged, these results more than justify the recommendations of these authors for exposure of the kidney in the loin, rather than continuing expectant measures and attempting instrumentation -H B1

Pyelitis of pregnancy occurs in about 2 per cent of pregnant women, and slightly more frequently in primiparæ Dilatation of the ureters, which occurs during pregnancy and which becomes still more marked if pyelitis supervenes, is explained by (a) The prodigious quantity of hormones circulating in pregnant women, one of these hormones acts on the uterus, to keep the musculature in a state of atony, it is not surprising that this hormone may also cause atony of the musculature of the ureters (b) The other factor is pressure of the enlarged uterus against the pelvic brim. When the diagnosis is established, A J Kobak and E H Schirmer<sup>10</sup> recommend that the patient should receive 15 g of sulphathiazole, as well as sodium bicarbonate, four times a day Liquids are given to a maximum. If there is secondary anæmia, blood transfusion should be considered in necessary cases The sulphathiazole should be discontinued when the temperature has been normal for two days. If the response is not favourable, ureteric catheterization should be resorted to, but in this series it was only necessary in two cases. These recommendations accrued from the observation of 143 cases of pyelitis of pregnancy occurring at the Cook County Hospital, Chicago, during a period of 21 months

Tuberculosis.—E Hurry Fenwick's<sup>11</sup> last contribution to urological literature was made at the age of 88, shortly before his death. A lady from Singapore had nephrectomy performed by him for tuberculosis 45 years ago. At the time of his communication she was 70 years of age, happy, and free from pain, and a son, born after the operation, was in the Royal Air Force.

C Wells<sup>18</sup> finds that the risk of tuberculosis developing in the remaining kidney after nephrectomy, is small, unless the disease was present (usually unrecognized) at the time of the initial investigation

- G. E. Kenny et al <sup>13</sup> find that tuberculous bacıllurıa, where the urine cultures for tubercle bacıllı are positive yet no pathological change can be demonstrated by a complete urological investigation, is common in sanatoria populations. On the other hand, an increased number of white blood-cells, albumin, or blood in a tuberculous individual calls for a urological investigation, and often uncovers a pathological tuberculous lesion of the urinary tract. Three hundred sanatoria patients were examined cystoscopically by D. Band<sup>14</sup>. 21.3 per cent were found to have tuberculous bacıllurıa. The recovery-rate of these patients was 23 per cent, and in these the bacıllurıa disappeared. By examining the kidney of those patients who died, Band concludes that minute tuberculous lesions, usually to be found only by microscopical examination, under favourable circumstances, healed
- E L. Keyes<sup>15</sup> describes the necropsy upon a surgeon, who, 22 years previously, had cutaneous ureterostomy performed on the sole remaining kidney for intractable tuberculous cystitis. The patient had conducted a successful surgical practice all these years. Death was due to tuberculous peritonitis and disseminated tuberculosis.

Renal Calculus.—Ambroïse Pare performed the first nephrolithotomy. His patient was a free archer of Meudon, who was charged with larcenies and condemned to hanging. It was suggested that as the condemned man was suffering from stones in the kidney, it would be important to observe the seat of the disease in a living subject. Two large stones were extracted, and after fifteen days the patient was cured, and secured a remission and a gift of money (A. Castiglioni. 16)

- B W Goldstone<sup>17</sup> points out that it is the small renal calculus within the substance of the kidney that is often so difficult to locate and extract. He rightly disparages splitting the kidney in order to find the stone. This procedure is often attended by post-operative catastrophic hamorrhage. The method he advocates to locate the stone is to insert several straight needles into the kidney and then have it radiographed. The needle nearest to the calculus is the guide to the incision.
- J. E Dees<sup>18</sup> is elaborating a method of removing small multiple calculi from the interior of the kidney. The method consists in filling the renal pelvis through the rubber catheter introduced through a small pyelotomy incision with a firm coagulum obtained by mixing 2 per cent globulin with fibrinogen. The calculi become entangled in the firm coagulum, which is removed by extending the pyelotomy incision. The method appears to have been effective in the small series of cases in which it has been tried.

Neoplasms.—Fortunate is the patient whose renal tumour bleeds early (*Plate XXI*). Renal neoplasms are more common in men, the ratio being 2 5 to 1.

Five out of six renal neoplasms are *Grawitz tumours* Grawitz tumours, so-called, are clear-celled carcinomata arising from the epithelium of the tubules or from clear-celled adenomata. They are the commonest kidney tumours Granular-celled carcinomata or adenocarcinomata, M. M. Melicow<sup>19</sup> believes, arise from the epithelium of the glomerular tufts or from granular solid adenomata

J. R. McDonald and J T Priestley<sup>20</sup> show that the prognosis in cases of Grawitz tumour is materially affected by the presence or absence of a tumour thrombus extending into the renal vein. Approximately 20 per cent of cases of renal tumour coming to operation have such an extension of the tumour if it is recognized and removed intact, the patient stands a change of survival if the tumour thrombus is clamped in the renal pedicle or the thrombus is dislodged into the venous system by rough handling, metastasis, particularly into the lungs, follows inevitably. In cases of nephrectomy for tumour, good

## PLATE XXI

## GRAWITZ TUMOUR

(HAMILION BAILIY)



Fig A—Retrograde pyelogram in a case of a Grawitz tumour of the left kidney The only symptom was one attack of painless hæmaturia

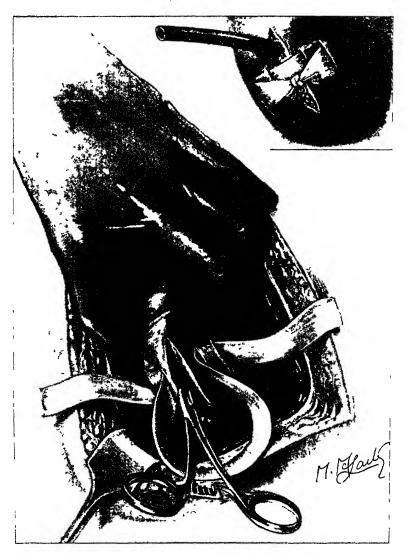


Fig B —Colour photograph of the excised kidney, showing a Grawitz tumour

# PLATE XXII

# NEPHROLITHOTOMY

(O S Lowsies)



Lowsley's method of performing nephrolithotomy Whenever possible the inferior pole of the kidney is entered, and the ribbon catgut is placed in readiness for closure of the incision before the stone is extracted (After O S Lowsley)

exposure and gentle handling are of paramount importance. After visualizing the pedicle, the renal vein is palpated for a thrombus. If such is present, when possible, the vein is ligated distally beyond the thrombus. In other circumstances it is necessary to open the renal vein or the inferior vena cava and extract the thrombus. The inferior vena cava can be sutured without undue difficulty. Removal of a tumour thrombus will make the difference between certain failure and at least the possibility of a satisfactory ultimate result. [On two occasions I have opened the inferior vena cava in the course of abdominal nephrectomy for a large Grawitz tumour, and have removed a tumour thrombus, subsequently repairing the vessel, which holds sutures well. One of the patients is alive and well 8½ years after the operation—H. B.]

S H Colvin<sup>21</sup> records that the term 'capsuloma' was coined at the Mayo Clinic These tumours consist of smooth and fibrous tissue, although a certain proportion contain fat and epithelial elements. They are located in, or just under, the renal capsule in 5 per cent of subjects over 40 years of age. They are innocent tumours, which give rise to no symptoms

After a study of 75 cases of papilloma of the renal pelvis occurring at the Mayo Clinic, J R McDonald and J T Priestley<sup>20</sup> have come to the conclusion that the nomenclature of these tumours should be revised, and a better term would be carcinoma of the renal pelvis, for the survival-rate five years after nephrectomy or nephro-ureterectomy is only 52 per cent. One of the principal dangers of this condition is thrombosis of the renal veins, with neoplastic infiltration. When this has occurred, the chances of lengthy survival is very small and constitutes the cause of the grave issue in all but early cases. Routine cystoscopic examination at intervals after operation is essential so as to be able to detect possible recurrence in the bladder of papillomata, which usually first appear around the corresponding ureteric orifice.

Sarcomas of the kidney arise from the connective tissue of the renal cortex and medulla, 1 e, from the capsule, smooth muscle tissue, and from the fibrolipomatous elements in the renal capsule. These tumours are rare, 35 cases being collected at the Mayo Clinic (W Weisel et al 22)

Only 30 cases of cure of a Wilms' tumour are reported in the literature, and of these only 13 have been proved alive and well five years or longer N. F Ockerblad and H E Carlson's23 patient was operated upon at twelve weeks of age, and was alive and well at the age of  $8\frac{1}{2}$  D A Wood<sup>24</sup> has collected 16 cases of Wilms' tumour occurring in adults between the ages of 22 and 64 While Wilms' tumour occasionally makes its first appearance in adult life, it is pre-eminently a condition occurring in children, and the average age is about three It is, indeed, the commonest malignant abdominal tumour of childhood One hundred and one cases are reported from the Mayo Clinic by W Weisel et al 25 In the great majority of cases a swelling of the abdomen was the chief complaint Hæmaturia was a cardinal symptom in only 5 per cent of cases The prognosis is gloomy In 44 cases nephrectomy was performed, and only seven were living 2 to 20 years after the operation authors consider that a course of deep X rays for three weeks, which causes considerable diminution in the size of the tumour, then abdominal nephrectomy, followed by a further course of deep X rays, gives the patient the best chance m this very depressing neoplasm

C. H Tanner<sup>26</sup> describes a case of intraperitoneal rupture of a Wilms' tumour in a girl of 6 The rupture occurred spontaneously while the child was asleep.

Aneurysm of the Renal Artery.—This often casts a ring-like shadow due to calcification in its wall. O S Lowsley and E M Cannon,<sup>27</sup> in reviewing the literature, find that the diagnosis is rarely made before the aneurysm bursts Of 29 patients subjected to nephrectomy, 26 survived

Operations on the Kidney: Recent Work.—C. P Mathé<sup>28</sup> has had many cases of unqualified success following partial nephrectomy (Fig 34) for double kidney, hydrocalicosis, localized hydronephrosis, renal cysts, and horseshoe kidney. As he emphasizes, it is highly desirable to conserve renal tissue whenever possible, and a patient can sustain life on one-half of one kidney. Whenever

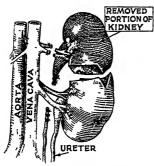


Fig 84—Heminephrectomy
The superior half of a double
kidney being excused. The suplying vessels and the corresponding ureter are divided between
ligatures before the resection
(After C P Mathé)

possible, he ligates the supplying vessels before resecting the appropriate segment supplied by those vessels

Ten years ago William P Didusch, the wellknown urological artist, suggested ribbon catgut to O S Lowsley,29 who reviews his work with it over that period It has been found highly satisfactory in many operations where it is desirable to conserve renal parenchyma also been used for nephropexy and hermorrhaphy. Perhaps its greatest use is for closing an incision in the renal parenchyma after nephrolithotomy. Whenever possible, Lowsley prefers to enter the interior of the kidney through the inferior pole even if the stone is more distantly placed (Plate XXII) incising the kidney, slots are constructed to accommodate the ribbon catgut, which will eventually approximate the edges of the wound After the stone has been extracted, a nephro-

stomy catheter is placed in position. A piece of perirenal fat fills the wound and the ribbon catgut suture is tied G. F. McKim et al. 20 record the case of a middle-aged woman, who, twelve years after heminephrectomy on her sole existing kidney, was in good health.

C P Mathé and H J de Castillo<sup>31</sup> recommend two-stage nephrectomy in critically ill patients. Under local anæsthesia the first stage consists in nephrostomy. Suitable cases are those of infected hydronephrosis or pyonephrosis By employing early nephrostomy, sometimes nephrectomy can be avoided, in others it is a life-saving alternative, allowing the patient to be got into better condition for the more serious operation. Mathé and de Castillo also recommend clampless nephrectomy (see Medical Annual, 1941)

R Lich<sup>32</sup> presents a novel method of performing nephropexy
The 12th rib is isolated subperiosteally, and after a suitable tunnel has been made under the capsule of the posterior surface of the freed kidney, the rib is passed into this tunnel. The tip of the 12th rib is then broken and sutured to the periosteum of the 11th rib (Fig. 85)

Duodenal Fistula following Nephrectomy.—D H Schneider<sup>33</sup> finds that this complication is not as rare as is generally supposed, and he believes that it could often be avoided by performing subcapsular, rather than extracapsular, nephrectomy C B Taylor and J M Taylor<sup>34</sup> do not favour conserva-

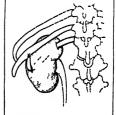


Fig 35 —Costal suspension of a kidney via its capsule (After Lich)

tive treatment, when the condition of the patient justifies operative treatment. In their case direct closure of the fistula proved successful

REFERENCES —  $^1Med$  World, 1944, 60, 541,  $^2J$  Urol 1944, 51, 228,  $^2Ibid$  117,  $^4Urol$  cutan Rev 1944, 48, 169,  $^3J$  Urol 1944, 51, 1,  $^4Amer.$  J Surg 1948, 61, 318,  $^7US$  Nav

# LACERATION OF THE PERINEUM AND THE USE OF EPISIOTOMY IN MIDWIFERY. Clifford White, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G.

The greatest disadvantage of a laceration of the perineum is that it may extend into the rectal wall and cause incontinence of flatus and fæces The repair of a complete tear is a major operation requiring considerable skill to obtain a good result and is certainly not a procedure for a doctor to tackle single-handed after he has just completed a difficult delivery, an anæsthetist and an assistant are required, the patient must be in the lithotomy position, and the light must Should the primary suture not unite, it is usual to wait 3 months be very good before performing a formal flap-splitting operation to close the rectum and repair the perineum. Attempts to carry out such a repair sooner than 3 months after delivery make the operation more difficult owing to the softness and vascularity of the tissues and greatly increase the risk of non-union Because of the great distress of the patient during this 3 months' delay, it may be worth while trying to get union by secondary suture on about the 10th day in certain favourable cases, such as one where gross sepsis is absent and where the suture has been broken down by solid fæces being passed too soon In such a case, as soon as it is obvious that the rectal wall is not going to unite, the wound is opened up fully and packed with sulphonamide vaseline gauze till the whole is covered by healthy granulations When this condition is obtained the bowels are very thoroughly opened (because no action will be allowed for 8 days after the secondary suture) on the day before the operation, an enema is not necessary since the rectal wall will be washed by swabs when the operation area is being prepared The secondary suture must be done in the lithotomy position and requires an anæsthetist, an assistant, and a full aseptic technique The granulations are all scraped away and the edges of the rectum and vagina may be very gently pared, but any extensive freshening of the edges will only cause bleeding which is very difficult to stop, and in no circumstances must any undermining or flap-splitting be attempted The rectal wall may be repaired with No 2 catgut, but the reviewer has had good results by using fine silkworm gut or horsehair interrupted sutures with the knots tied in the lumen of the rectum and the ends left long so that they hang out through the anus when the repair is completed The tissue is so soft that there is an advantage in using interrupted sutures, as if one cuts out, the rest are not affected, whereas if a continuous catgut is used and part cuts out, the whole suture is loosened The vaginal mucosa is repaired with continuous catgut, and the perineal body brought together by thick silkworm-gut sutures passed from the skin of the permeum up to (but not through) the vaginal mucosa These sutures should be placed half an inch apart, as the approximation of the perineal body depends on them, catgut must not be buried in the perineal body. Since the tissues are certain to swell, the silkworm-gut sutures should not be tied tightly. It is not worth while attempting a secondary suture while sloughs are still present, and success is less probable after about the 14th day

P Malpas¹ reports 6 cases operated on during the last two years, 4 were re-sutured within fifteen days, and the remaining 2 as long as three and four weeks after delivery because of pyrexia All 6 patients obtained complete control of the rectum He uses interrupted No 2 catgut for the rectum and

silkworm gut for the permeal skin. He drains the rectovaginal space by a rubber drain for two days. Stress is laid on the necessity for particular care in closing the highest portion of the rectal tear

Episiotomy has the advantage of obviating the occurrence of a complete tear, and J. D S. Flew2 reviews this subject and gives his own experience and He points out that prolonging the second stage to give the perineum time to stretch and so save it tearing often results in a thin, sagging pelvic outlet, and subsequently a cystocele and rectocele occur although the permeum is not torn. The patient then has symptoms of prolapse even if the uterus is maintained at its normal level by the cardinal ligaments He points out that, as the head meets the pelvic floor in a primipara, a trickle of bright blood often occurs, showing that a laceration of the soft parts has occurred, and, after delivery, this laceration can be seen low on the posterior vaginal wall, but, if the permeal skin is intact, this laceration will probably not be looked for or repaired Thus, it seems probable that in the past too much attention has been given to preventing a perineal laceration, and it is possible that a laceration followed by an adequate repair may be less likely to cause 'prolapse' than an over-stretched, although intact, perineum If this is so, it follows that a clean-cut episiotomy incision when fully repaired will be better than a

Fielding Ould (Treatise on Midwifery), in 1742, mentions the possible advantages of perineal incisions, and Michælis advised a median incision in 1799, but the modern text-book rarely gives more than a few lines on the subject. Flew states that an episiotomy should be performed "in every case in which the perineum seriously delays the birth of the presenting part, in which there is need for intravaginal manipulation or forceps delivery, in all primigravidæ, and some multiparæ" Considering these indications in detail: "Serious delay" may be taken as meaning that the presenting part is on the perineum for half an hour with pains of average strength and frequency, less than half an hour if signs of fœtal distress or undue maternal distress are present, or if the presenting part is making little advance Should the perineal skin start to crack superficially before the head is crowned a tear is inevitable unless prevented by a timely incision In the event of signs of feetal distress with the head on the pelvic floor, an episiotomy and fundal pressure may effect delivery more quickly than the application of forceps

M M Berlind<sup>3</sup> advocated episiotomy in all cases in which the fœtus is known to be premature in order to prevent cerebral hæmorrhage from pressure and moulding Similarly "the delivery of a primigravida by forceps is an absolute indication for episiotomy. A breech delivery in a primigravida is another absolute indication both for the delivery of the after-coming head and for any intravaginal manipulation such as the bringing down of an extended leg. The spontaneous delivery of a persistent occipito-posterior 'face to pubes', a face presentation, and any case in which there is a narrow pubic arch should be placed in the same category. If a patient who has had a colpo-perineorrhaphy performed be delivered per vaginam then episiotomy is essential".

The moment at which episiotomy is to be performed is often difficult to decide, but it must be remembered that the operation is being done to minimize the damage to the unseen utero-vaginal supports, in addition to preventing a visible permeal laceration, and as stated by H. A. Gusman<sup>4</sup> it is useless to wait till the permeum is of but tissue-paper thickness, for by then the former damage has already been incurred. Many episiotomies are performed too late to benefit the patient to the fullest extent. Episiotomy should be carried out as soon as permeal bulging is marked. Local anæsthesia may be used to supplement a gas and oxygen anæsthesia if desired.

Flew draws attention to some anatomical points (Fig. 36) that the blood-supply to the perineum comes in mostly from the side, where the superficial and transverse perineal arteries arise from the pudendal, whereas the middle line is comparatively free from vessels. The muscles are attached to the median raphe and run medially and backwards. When incised the median portion will retract backwards, and so when repairing such an incision care must be taken to pull the median portion upward before inserting the sutures, otherwise correct apposition will not be obtained. The duct of Bartholin's gland opens into the groove between the labium minus and the hymen, so an incision that does not commence strictly in the middle line will run the risk of dividing

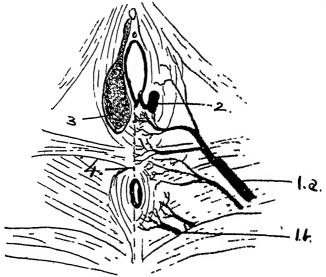


Fig 36—Anatomy of permeal region. 1a. Internal pudential artery, 1b, Inferior hæmorrhoudal artery, 2, Bartholm's gland und duct, the latter looping downwards, 3, Spongy tissue, greatly augmented during pregnancy. 4, Median raphe.

this duct. For these reasons he advocates an incision starting strictly in the midline and continuing in the midline to within an inch of the anus, when the cut is directed towards the ischial tuberosity to try to obviate the risk of the tear going into the rectum (Fig. 37).

R. A D Gillis had extension into the rection in 8 out of 500 median episiotomies. Flew gives the results of 135 consecutive primiparous patients who were delivered per vaginam. They are as follows:

Apart from the case of hydrocephalus, all the limbies were alive and well except one delivered by forceps who died of pneumonia on the 6th day. Postmortem examination did not show any carebral humorrhage. Of the 72

episiotomy patients, 2 (2.8 per cent) had slight symptoms referable to vaginal herme 6 months later, but they improved with palliative treatment; whereas of the 63 cases of normal delivery without episiotomy, 5 (8 per cent)

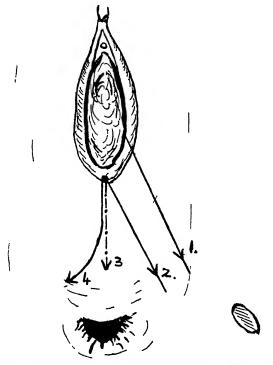


Fig 37—Incisions for episiotomy 1, Lateral (incorrect), 2, Medio-lateral (correct), 3, Median, 4, Flew's method (Figs 36, 37 by kind permission of the British Medical Journal')

had the same symptoms Apart from these results the average tone of the vaginal walls was better in the episiotomy patients T N A Jeffcoate and W Hunters seem to hold similar views

REFERENCES — Brit med J 1944, 1, 590, 'Ibid, 2, 620, 'Med J Rec 1982, 135, 180, 'Ohio St. med J 1932, 28, 653, 'Amer J Surg 1930, 9, 520, 'Brit med J 1944, 2, 735

#### LEGAL DECISIONS AND LEGISLATION.

D. Harcourt Kıtchın, Barrıster-at-Law

LEGAL DECISIONS

Divorce for Insanity.—Soon after the passing of Herbert's Act (the Matrimonial Causes Act, 1937) the probability came to be recognized that the court would one day have to decide whether the absence of an incurable mental patient from hospital on parole deprived his or her spouse of the right to a divorce for insanity. The difficulty lay in the wording of the Act. By s 2 a petition for divorce may be presented on the ground that the respondent is incurably of unsound mind and has been continuously under care and treatment for at least five years immediately before the date of the petition. A

patient is deemed to be "under care and treatment" while he is detained in pursuance of any order or inquisition under the Lunacy and Mental Treatment Acts, 1890-1930 (and under certain other special Acts), "and not otherwise" The question of continuity arose very soon in Shipman v. Shipman. The wife in this case had been incurably insane for many years. Between Christmas and the spring of each of the five consecutive years before the petition she had been released for a long period to live with her sister in all, she had been absent for 346 days The President, Sir Boyd (now Lord) Merriman, said that, though it was not necessary to draw the line at any precise point, absence on trial for prolonged and indefinite periods must constitute interruption of detention. On the other hand, he would be disposed to consider as on the right side of the line routine outings in the daytime, and the leave of absence for three nights or four days which a superintendent may grant under the regulations A little later, in Green v Green,2 his Lordship found that absence in other circumstances had not interrupted the detention. During the fiveyear period the husband was sent for a fortnight to a house at Whitstable , belonging to the Mental After Care Association, as one of a party of patients from London County Council mental hospitals The President took the view that the Association and its officers were acting as agents of the Council

Neither of these cases, of course, covers the typical situation of release on parole, a concession which is commonly agreed to be a valuable aid to the patient's treatment and desirable from many other points of view. That situation has now come before the court <sup>3</sup>. The respondent husband had been absent for several periods, which 'fell into two classes. He was given super-intendent's leave 19 times for periods of two or three successive nights—43 nights in all. Secondly, he was twice permitted to be absent on trial by two visitors on the written advice of the superintendent under s. 55 (1). One period lasted two weeks and a day, the other lasted six weeks and three days, the respondent's father, who had control of him, bringing him back some days before the expiry time because his condition had deteriorated. The President held that these longer absences had interrupted the detention, though the shorter absences might be disregarded under the principle de minimis non curat lex

This decision naturally caused consternation among mental hospital authorities, for it seemed intolerable that the patient's interest should so conflict with his wife's legal rights Fortunately, the Court of Appeal found themselves able to reverse it and resolve the dilemma Lord Greene, Master of the Rolls, remarked that the detention is the sole test of whether the care and treatment has been continuous Neither phrase is defined in the Lunacy Act, where they are often used together For instance, the justice certifies when making the reception order that the lunatic is a proper person to be detained under detention ends, care and treatment end, when care and treatment are no longer required, the detention is ended by discharge Part II of the 1890 Act is headed "Care and Treatment", and one of its subdivisions is headed "Absence Under this subheading s 55 provides for three on Trial or for Health" classes of absence absence on trial by permission of two visitors, the sending or taking of a private patient to a specified place for the benefit of his health, and absence for 48 hours by permission of the medical officer. It was clear to the Master of the Rolls that the Legislature had treated all these absences, not as an interruption of care and treatment, but as part of them They are methods of taking care of and treating the patient, and may be highly beneficial. If they are methods of providing care and treatment, and if detention is for the purpose of care and treatment, then they ought not to be regarded as interruptions of the detention These and other provisions of the Act confirm, he said, that detention is rather a status than the physical fact of being kept under lock and key

He criticized Lord Merriman's three decisions in the light of this interpretation. Shipman, 1 it seems, was wrongly decided, for the President ought not to have treated the reception order as being in abeyance during Mrs. Shipman's absences, long though they were. She was absent on trial and therefore still detained. In Green's case' Lord Merriman was wrong in treating the association who owned the seaside home as agents of the L.C.C. Nobody but the L.C.C. said Lord Greene, had the right to detain the patient, and they could not delegate this right. 'The only justification for sending the patient to the seaside home was the grant of leave of absence on trial, and that case was indistinguishable from any other case of absence on trial. In the third, the present, case the Master of the Rolls doubted whether the principle of de minimus ought to be applied to the shorter absences of the patient. If detention means detention is a physical sense, four days' absence interrupts it just as much as does forty days. The reason why these shorter absences ought not to be regarded as interruptions is that detention is not a physical state but a legal status

Lord Justice MacKinnon delivered a judgment in a similar sense, with an amusing illustration from Dickens. If a century ago, he said, some Act had referred to detention for five years in a debtors' prison, he thought that a man who was living in the Rules of the Fleet and not inside the prison itself would have been so "detained". The husband, when visiting his father, was much more detained in the mental hospital than a debtor had been detained in the Fleet Prison while he lived in the Rules. The dirty man in the brown coat (No 20 on the coffee-room flight), whose story was told to Mr. Pickwick by Sam Weller in the Fleet, was "detained" in that prison until he died, although, after 17 years' strict incarceration for a debt of £9 multiplied by five for costs, he was for a long period let out daily by the turnkeys to spend his time in public-houses.

The Court of Appeal obviously came to a sensible and practical decision. When, however, the Act is revised, there is much to be said for modifying the test of care and treatment to conform to that of the Scottish Act, which says that a person is under care and treatment as long as the order for his detention is in force. When a patient is absent from the hospital the order remains in force, and detention therefore persists, for twenty-eight days. No uncertainty arises of the kind which the Court of Appeal has just resolved in Safford's case

Survivorship in an Air-raid.—Wills often leave property "over"—e g, to a named person and, on his death, to another If two such persons die together in the same accident, the court may have to inquire which died first, for if A died before B, B will have succeeded for a brief time to the property and so it will pass to his representatives, whereas if B died before A he never came into ownership and so his representatives have no rights, the property devolving on the representatives of A Before the property legislation of 1925, persons involved in the same calamity were assumed to have died at the same moment unless the evidence showed that they did not Under the new law they are presumed to have died in order of seniority, the younger surviving the elder The law of survivorship has come into some prominence now that groups of civilians are often killed by the explosion of the same bomb. In a case of this kind tried in 19424 a married couple were found dead in the ruins of their villa at Torquay, the judge took the view that two persons are most unlikely to die at exactly the same moment, and found that the evidence was not sufficient to show that this couple had done so. Last year, however, the Court of Appeal tried a similar case and came to a different decision 5 A bomb fell on a house

in Chelsea and killed five persons in the basement. Two of these left property by will, and a relative asked the court to hold that the gifts failed because all the deceased ought to be held to have died simultaneously. Lord Greene, Master of the Rolls, did not think that time is really infinitely divisible (and hence two deaths are never simultaneous) from a practical point of view earlier times, he said, the sort of calamity in which two persons might lose their lives, such as fire or shipwreck, left a reasonable probability that one survived the other To speak of the infinite divisibility of time in relation to a modern bomb bursting in a basement shelter seemed to him to ignore the realities of the case He thought that a litigant who wished the court to presume death in order of seniority under the 1925 Act must satisfy it first that the proper inference from the circumstances is that the deaths took place consecutively, and also that the circumstances leave the court in uncertainty concerning which died first Each of these questions is one of fact to be decided by evidence If the weight of evidence points to the conclusion that the deaths were simultaneous, the court may draw that conclusion in spite of the remote possibility that it may be incorrect. In the present case he thought the only proper inference to draw was that all the victims died simultaneously. Such an inference, however, ought not necessarily to be drawn every time two persons are killed by the same bomb If they were some distance apart, a court having evidence of the capricious nature of blast might refuse to draw the inference, and if one were considerably nearer to the explosion than the other, the proper inference might be that the nearer one died first. Where the court is satisfied of the order of the deaths, or that the deaths were simultaneous, the statutory presumption does not operate, for the Act says that the victims are presumed to have died in order of seniority only where the circumstances render it uncertain which of them survived the other. The upshot of the decision is that the court may come to the conclusion which best fits the evidence, the presumption of death in order of seniority only holds where the evidence is insufficient

Failure of a Hospital's Legacy.—Every voluntary hospital relies on charitable bequests for part of its revenue, but the vagaries of the equitable rules concerning charitable trusts form a sinister background to its hopes Not for the first time in fairly recent memory, a hospital has had snatched from it by decision of the court a large bequest which must have seemed assured this hospital had already spent any of the sum did not appear The misfortune arose from the dangerous practice by which some testators leave money to a charity with a condition that their tombs shall be kept in repair and order. Lady Dalziel of Wooler left in her will £20,000 free of duty to the governors of St Bartholomew's Hospital It was to be added to an existing "Dalziel of Wooler Discretionary Fund" of about £2500, which had been established shortly before she made her will A first charge on this fund was the cost of keeping up the family mausoleum in Highgate Cemetery. The executors desired to test the validity of this disposition in the will, and brought suit 6 Mr Justice Cohen had before him a large number of authorities which left him in no doubt that it was invalid. While, he said, a body formed for charitable purposes may receive and apply funds given to it absolutely in paying for the upkeep of a tomb, the upkeep is itself not a charitable object. Many decided cases in which upkeep of a tomb was a condition of a bequest to a charity have allowed the charity to keep the money, but in all of them either the amount involved was trifling, or the testator intended to impose a merely moral obliga-In the present case the tomb had cost over £20,000 and the hospital was hable to rebuild it if necessary; and also, if the hospital failed to maintain the tomb, the money was to go to other charities selected by the trustees—a "gift over". The obligation was intended to be legal, not merely moral Moreover; even if it had been moral only, the gift could only have been charitable if the purposes of the discretionary funds of the hospital were also charitable. The evidence showed that the governors were free to apply these funds to the maintenance of the Dalziel tomb or any other where the expenditure was considered necessary in order to secure financial support for the hospital. This, said the judge, is clearly not a charitable object. A third snag was waiting for the hospital if it cleared these two the charge to maintain the tomb, imposed on the discretionary fund, probably infringed the "rule against perpetuities". The law will not allow a testator to the up property for more than a certain definite time in the future existing lives and 21 years after. To hinder the alienation of property for longer than that is repugnant, and a condition purporting to do so makes a bequest invalid.

The question of what constitutes a charitable trust has a very involved answer. To the layman it may seem absurd that he cannot leave his money in trust to buy wine for his club, or to his friends on trust to found a racecourse to be named after him. The courts, however, will not recognize a trust as charitable unless its objects come within the narrow limits of the furtherance of religion or education, the relief of poverty or sickness, or a few other such altrustic aims. The danger illustrated by this case is relatively rare but is none the less real. Hospital trustees and officers would do well to remember, if ever they discuss with a benefactor his intention to leave the hospital a legacy, to temper their joy with caution and to take every possible step to have the will so drafted that the testator's intentions are not defeated by infraction of the rules governing charitable bequests

Compensation Lost through Defective Treatment.—A workman is injured at work, he puts himself under qualified medical care and obeys his medical advisers implicitly One of them, through insufficient care, misdiagnoses his condition and his injury is aggravated. Can that misfortune, besides causing him more illness, pain, and disablement, also deprive him of the compensation which injured workmen are given by statute? Common sense would not suppose so, but the law says it can Moreover, although this possibility has been brought recently into special prominence, it is by no means new merely does not happen to have attracted much attention In a case which came before the Court of Appeal last summer,7 the workman fell on his shoulder, dislocating it and causing a small fracture at the top of the humerus close to the dislocation At the neighbouring cottage hospital a radiograph was made of the swollen and bruised part of the arm but not of the shoulder His arm was bandaged and he was taught exercises Later the pain got worse, and he came under a first-class orthopædist. Another radiograph showed a fracturedislocation of the shoulder which could not now be reduced. The arbitrator refused the workman compensation on the ground that the negligence which he found to have been committed in the cottage hospital constituted a novus actus interveniens, a fresh cause of damage, so that his present incapacity was due substantially to bad medical treatment and not to the original injury

The workman appealed, and the Court of Appeal found themselves divided on what they fully admitted was a very important and far-reaching question of law. Lord Justice Luxmooré, in the last judgement he delivered before his death, considered himself bound by a line of earlier cases. In one of these the Court of Appeal had formulated this test question. "Is or is not the condition of this man due substantially to the original accident, or to the mismanagement of the medical man?" This was precisely the question the county court judge here had answered. In the earlier case the workman broke his arm and the unskilful intervention of a bone-setter permanently crippled him. In, the

second case also the workman broke his arm, the hospital doctor failed to set the broken bones properly, and his negligence caused a permanent disability. The workman, in the judge's view, would, if properly treated, have completely recovered before the date of the arbitration. He was refused compensation. Yet another case was mentioned, in which the doctors had disagreed over the proper treatment of an injured toe—an amputation was done which the judge held to be unnecessary and improper, so that he found the workman to be suffering from the effects of the operation and not from the effects of the accident. In the present case Lord Justice Du Parcq took a similar view—Both he and Luxmoore, L.J., treated the question as one of fact—had the original cause, the injury at work, ceased to operate and a new one, the negligent treatment, taken its place? The county court judge found as a fact that the original cause was exhausted—The Court of Appeal may not interfere with a finding of fact unless there is no evidence to support it, and so the workman's appeal had to be dismissed.

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Lord Justice Scott, however, vigorously dissented in a long and closelyargued minority judgment He did not think the court was bound by precedent, for he pointed to another line of cases which he considered to establish a contrary principle Where two of its previous decisions are inconsistent, the court may follow either or take a new line The Workmen's Compensation Acts ought, he said, to be construed in their broad popular sense A workman may have compensation if his incapacity "results from the injury" If a man sees his friend lame and is told that the cause was an injury by accident at a factory, he will not regard the answer as any less true because he is told that with better medical treatment his friend might have got well, or that improper medical treatment has aggravated the lameness. The human body is constantly changing under the varying influences of uncountable external and internal factors Whenever its natural processes are upset by injury or disease, a new set of physical changes is set in operation. In every workmen's compensation case a complete historical diagnosis would disclose innumerable new causes contributing to the later condition of the workman Scott, LJ., was shocked by the implication that a workman's right to compensation depends on the degree of skill or care of his doctors and nurses Such an interpretation seemed to him inconsistent with the fundamental provisions of the Acts Moreover, he asked, why should it matter whether negligent treatment and not some other cause aggravated the injury? It surely makes no difference whether the staff are negligent or merely mistaken or unfortunate in their treatment, or whether the workman's condition is made worse by a cold draught, bad food, shortage of a particular drug, an accident, an infection, All these factors affect the issue of causation equally with or an enemy bomb negligence Theoretically there is an endless vista of inquiry about the extent to which the workman's final state can be attributed to other causes than the injury No such inquiry was ever intended by the Acts A medical referee may give, without hearing evidence, a conclusive certificate on the extent to which the workman's incapacity is due to the accident. He cannot possibly be expected to make any such inquiry Moreover, Parliament has deliberately abstained from saying one word about the possibility of the medical treatment being mistaken, still less of its being negligent. Negligence of those to whom the treatment of the patient is entrusted is wholly irrevelant to the social policy on which the legislation is based. The question before the county court judge was by no means a pure question of fact, it involved also the legal question whether in the sense of the statute the incapacity resulted from the injury So reasoned Scott, L.J He might have added that, but for the accident, the workman would not have been exposed to the risk of

the negligent treatment, and that this consideration, not a legalistic view of causation, should be decisive

Two reflections give some consolation for this deplorable state of the law. First, the case may go to the House of Lords Secondly, as part of the Government's plan of general social insurance, the whole fabric of workmen's compensation is to be re-shaped. The White Paper (Cmd 6551) plan promises great improvement. Let us hope that this time Parliament will succeed, where in 1897 it failed, in keeping injured workmen out of the courts and their restitution from depending on legal argument.

No Compensation for Hysteria.—For a generation or so the courts have awarded damages for nervous shock, as well as for physical injury, when it has been caused by negligence Sometimes the distance between the negligence and the nervous injury has seemed very long and tortuous Some Liverpool mourners, for instance, were awarded damages against the local authority because, when a hearse collided with a tram through the negligence of the driver, the coffin seemed for a moment to be in danger of injury 8 Compensation for war injury is not by any means so easy to obtain on these grounds A lady returned to her home after an air-raid and found the house damaged by blast. She was greatly shocked, and her already bad nervous condition, the result of a menopause induced by X rays at the age of 16, was exacerbated She claimed an injury allowance under the Personal Injuries (Emergency Provisions) Act, 1939, and the pension scheme made under it. War injuries are defined in the Act as physical injuries caused, among other things, by the impact on a person of anything dropped from an enemy aircraft By the scheme, 'disablement' in this connexion means physical or mental injury or damage, or loss of physical or mental capacity War injuries, by the Pensions (Mercantile Marine) Act, 1939, include tuberculosis and any other organic disease and its aggravations. The lady claimed that she had been disabled through mental damage due to one of the circumstances set out in the Personal Injuries Act The Pensions Appeal Tribunal found that she was outside the definition, for she had suffered no aggravation of an organic disease by the discharge of a missile, the use of a weapon, or the impact on her of an enemy aircraft or bomb She was merely suffering from having seen bombed property, a cause too remote to be considered within the definition. Moreover, even assuming that the X-ray treatment had produced an organic change, the hysteria was a functional and not an organic disease The High Court confirmed this finding on appeal. The decision seems to accord with a broad common-sense view of the kind of damage which should be compensable. It is a pity that the courts do not impose similar limits on the remoteness of damage when mental shock actions are brought at common law.

A Coroner's Verdict Reversed.—Appeals from the decision of a coroner are so rare that one may be excused for forgetting that they are possible Nevertheless, the Coroners Act, 1887, s 6, gives the High Court a supervisory jurisdiction over coroners. The Court may order an inquest to be held if the coroner refuses to hold one, and it may quash a finding of his court and order a fresh inquest for fraud, the rejection of evidence, irregularity in the proceedings, insufficiency of inquiry, or other similar reasons. The Coroners (Amendment) Act, 1926, gave the High Court the added power of ordering a fresh inquest when it is satisfied that the discovery of new facts or evidence makes this necessary or desirable. Its powers were invoked recently by the relatives of a young miner who was found dead in a disused working of a colliery. He had been engaged as a haulage hand in the lowest levels of the pit, but had complained that the work was too hard for him and been directed to another place. He never went there, and his body was later discovered in the disused

working, to reach which he had climbed over an obstacle and passed a notice which said "No Road". He had been asphyxiated by firedamp. The coroner concluded that the man had suffered from a sense of grievance and that he had committed suicide under some derangement of mind by deliberately going to a place which he knew to be dangerous because of firedamp. The Divisional Court, although they had heard none of the evidence, decided that there had been no sufficient evidence to justify the verdict, and that the coroner had misled himself into adopting a theory for which the evidence gave no foundation. There is a strong presumption against suicide, and, therefore, if this is alleged, it must be proved to the reasonable satisfaction of the tribunal. The court decided that satisfactory proof had not been given

#### LEGISLATION

Rehabilitation of the Disabled.—It is strange to reflect that five years ago few of us had heard of 'rehabilitation' The fact itself is no novelty, but the circumstances of the time and the country's urgent need of man-power have thrown an unusual emphasis on the necessity for forethought in the treatment of injured persons so that they may be restored to usefulness as early as possible It is also true, of course, that the wastage of working capacity before the war, when the supply of workpeople was greater than the demand, was shamefully prevalent Immense strides have now been taken in the planning of treatment for injured persons, and these have been facilitated by the Disabled Persons (Employment) Act, 1944. This measure put into effect many of the recommendations of the Tomlinson Committee on Rehabilitation The purpose of the Act is stated to be to make further and better provision for enabling persons handicapped by disablement to secure employment or to work on their own account. The definition of "disabled person" is very wide it includes everyone who on account of injury, disease, or congenital deformity is substantially handicapped in obtaining or keeping employment, or in undertaking work on his own account. He comes within the Act not merely if he is unable to do any work, but also if he cannot do a kind of work which apart from the cause of his disability would be suited to his age, experience, and qualifications Moreover, disease includes the results of imperfect development of any organ The Ministry of Labour may provide vocational training courses and industrial rehabilitation courses for persons who need them, the former for persons who have not already been trained, and the latter for those who have been trained but have been prevented from continuing their own work through their disablement. The rehabilitation courses are to be conducted under adequate medical supervision and in circumstances conducive to the restoration of fitness. In the words of the statute, they are to provide disabled persons with "physical training, exercise and occupation conducive to the restoration of fitness" The Minister may also provide such incidental facilities as may appear requisite to enable disabled persons to obtain the full benefit of the course He may, subject to Treasury approval, defray travelling and other expenses A register of disabled persons is to be kept, and the Minister may make regulations laying down qualifications and disqualifications for being on the register The Act sets out a few disqualificationsbeing under age, unreasonable refusal or failure to attend the course, residence abroad (for persons not in the Forces), and habitual bad character Disputes are referred to a district advisory committee Employers are obliged to employ a quota of disabled persons, the Minister may designate certain classes of employment which appear to afford specially suitable opportunities for the employment of disabled persons, and then only registered disabled persons may be employed in them The Minister may make special facilities for severely

disabled persons—presumably by way of settlements on the lines of Papworth He will be advised and assisted by a national advisory council and district advisory committees

REFERENCES — 1939, F 147, \*1939, P 309, \*Safford v Safford, 1944, P 61, \*Re Lindop, 1942, 2 Ch 377, \*Re Grosvenor, 1944, Ch 138, \*Re Dalziel, 1943, Ch 277, \*Roliviell v Caverswall Stone Co, Lid 1944, 2 All E R 308, \*Owens v Liverpool Corporation, 1988, 4 All E R 727, \*Young v Minister of Pensions, 1944, 2 All E R 308, \*Department of Pensions,

LEISHMANIASIS. (See KALA-AZAR; ORIENTAL SORE)

**LEPTOSPIROSIS.** Sir Philip Manson-Bahr, C M G, D S O, M.D, F R C P

In Eastern Germany, Poland, and Russia, a common form of leptospirosis is 'mud' or 'field' fever, of which Leptospira grippotyphosa is the usual infective organism. Here the disease is primarily a mouse infection. When various species of mice have become carriers of leptospiral infections, there seems to be a tendency, especially in Italy, for each of the various types of leptospira to become attached to some particular rodent species, but the experience of P Uhlenhuth is that the mouse is not such a universal source of infection as the rat with L icterohæmorrhagiæ

The field mouse, Microtus arvalis, appear to be the chief species concerned. W. Schuffner and H. Bohlander² state that it is characteristic of all pathogenic leptospire for the organisms to appear in the kidney and urine at an early stage of the infection. They may begin to appear by the 7th day or not until the 20th. The organisms tend to settle in the epithelium of the convoluted tubules, and there to build up colonies from which the leptospire get into the urine and may persist for long periods. Field mice infected with L grippotyphosa show a similar type of kidney infection to that in rats infected with L viterohæmorrhagæ. Whilst in the rat the infection persists for life, in the field mouse it is more intense and rarely persists for more than one month as a result of this, Weil's disease is more endemic than 'mud fever', which appears in relatively short summer or autumn epidemics. Other factors contribute to the spread of infection—flooding or mouse bite in the case of the latter, swimming and bathing in the former.

REFERENCES -1Z Immun Forsch 1948, 104, 388, 101d 287

## LIVER, CIRRHOSIS OF.

Sir Henry Trdy, M.D. FRCP

S W Hardikar and V Gopal Ras¹ (Osmania Medical College, Hyderabad) publish a preliminary note on an investigation into the aetiology of ascites which is being undertaken in Hyderabad. Ascites is attributed to cardiac insufficiency in 45 per cent of admissions in Massachusetts, and 87 per cent in Delhi, and only 28 per cent in Hyderabad, and to cirrhosis of the liver in 10 per cent in Massachusetts, 9 per cent in Delhi, and 28 per cent in Hyderabad. It would appear that cirrhosis of the liver has a higher incidence in the South-Eastern parts of India, where rice is the staple diet, than in the North-Western parts, where wheat is the staple diet. The authors found that a certain proportion of cases lost the ascites when given suitable diets in hospital, but tended to relapse on returning home. This occurred in rural working-class patients of low economic standard and in the absence of any recognizable disease of heart, liver, etc. They attribute the ascites to prolonged general malnutrition.

A S. Johnson<sup>2</sup> (Kittayam, Travancore) also calls attention to the frequency of currhosis of the liver and other liver diseases in Southern India. In his area, in which currhosis is very common, rice is used only in a limited area and the main crop is tapioca. By certain methods of preparation tapioca may

be toxic, and it is known that cattle die after eating the leaves of some varieties of the plant. The author believes that the frequency of cirrhosis of the liver is due partly to vitamin deficiency and partly to toxins present in the tapioca as prepared. [These articles call attention to the frequency of cirrhosis of the liver in a non-alcohol drinking population. The possibility that it is dietetic in origin is worthy of the investigations now being undertaken, but hook-worm infestation must be carefully excluded —H T ]

REFERENCES — 1J Indian med Ass 1943, 13, 1, 2 Indian med Gaz 1943 78, 227

#### LUNG, ABSCESS OF. (See also RADIOLOGY)

A Tudor Edwards, M Ch, F.R CS

This term comprises a multiplicity of conditions in which the prognosis, treatment, and underlying pathology are essentially different

These points have been clearly brought out by N R Barrett<sup>1</sup> in a paper on lung abscess which seeks to clear up some of the confusion. In this account he takes certain examples for description as being sufficiently clean-cut to warrant definite conclusion. Thus he divides them into (1) Solitary putrid abscess, (2) Aerobic abscess, (3) Staphylococcal abscess, (4) Bronchial abscess, and (5) Suppurating hæmatoma of the lung.

1 Putrid abscess is caused by inhalation of infected matter into the terminal bronchioles of a bronchopulmonary segment, and certain definite anaerobic organisms are found in the bronchial embolus. The anaerobes concerned are probably Vincent's bacillus, spirochætes, B melanogenicum, vibriones, and staphylococci, and are commonly found around diseased teeth

The lesion in the lung is a localized acute infective gangrene near the surface of the lung, rapidly involving the pleura, and producing early adhesions. Sloughs are found in the abscess cavity which is quickly produced. Rupture into the bronchus occurs, and satisfactory drainage by this channel results in healing in one-third of the cases. In the majority drainage by the bronchus is incomplete, and it is impossible without observation over a short period to determine which cases will resolve spontaneously. It is essential to remember that the mortality of treatment of any kind increases as time passes.

The diagnosis depends on the history, associated with offensive, purulent expectoration, and X rays may show a cavity containing a fluid level in an area of consolidation. Absence of a cavity on X-ray examination occurs in half the cases, therefore is not essential for the diagnosis

2 Aerobic lung abscess is preceded by a diffuse bronchopneumonia, some of the consolidated areas resolve, some become organized, and some progress to abscess formation, but there is a tendency for the lesions to remain in a state of non-resolution

Although some of these small abscesses discharge through the bronch, others coalesce to form a large abscess, but this occurs slowly, is incidental to the atypical pneumonia, and drainage is unlikely to produce dramatic amelioration.

3 Staphylococcal abscess may follow a staphylococcal pneumonia which is associated with a 60 per cent mortality

The signs are those of bronchopneumonia, and the clinical state resembles septicæmia with cyanosis and fever of the remittent type. Abscesses form in relation to the bronchi and tend to become confluent. Multiple small abscesses develop throughout the affected area and resolve as the pneumonia recedes

Pyæmic and septicæmic staphylococcal lung abscesses are part of the generalized infection, but there is always a tendency for such infections to become localized and to heal if the pus is evacuated. These abscesses tend to perforate into the pleura and may cause a tension or spontaneous pneumothorax. Characteristic X-ray appearances consist of opacities that are widespread and

dense, with rather definite outlines disposed throughout the lungs. The diagnosis depends upon demonstration of the organism in the blood, sputum, the abscess cavity, or the pleural effusion. Conservative measures are indicated and drainage rarely required

- 4 Bronchial abscess is usually due to obstruction of bronchi by a relatively large foreign body behind which infected secretions collect and become purulent. If the foreign body is removed by bronchoscopy the process ceases and the condition returns to normal. The X-ray appearances are those of atelectasis with the foreign body apparent or not
- 5 Suppurating hæmatoma of the lung is somewhat ill-defined. The hæmatoma means extravasation of such an extent that the lesion can be diagnosed radiologically

If infection takes place a lung abscess forms, and the diagnosis is confirmed by the presence of blood-stained purulent sputum and by radiography showing a cavity with a fluid level in it—The great majority of suppurating hæmatomas resolve spontaneously and healing is complete

REFERENCE -1 Lancet, 1944, 2, 647

### LYMPHOPATHIA VENEREA (LYMPHOGRANULOMA).

T Anwyl-Davies, M.D., F.R.C.P.

Comparison of the Complement-fixation and the Frei Tests.—A W Grace and G. Rake¹ have compared the complement-fixation test with the Frei test in 180 lymphogranulomatous and 72 non-lymphogranulomatous patients Positive results with both tests were obtained in 52 per cent, 133 had either a positive complement-fixation, a positive Frei reaction, or both, 977 per cent reacting positively to the former and 812 per cent to the latter. As these percentages represent the relative degrees of sensitivity of the two tests, the complement-fixation reaction is to be preferred. Prolonged therapy with sulphonamides did not remove the complement-fixing antibodies from the serum of the lymphogranulomatous patients, and so the authors believe the infection is not entirely cured but only altered into an inactive, latent form

Meningo-encephalitis in Lymphogranuloma.—Two cases are reported by C J. D Zarafonetis2 (Washington), who offers additional evidence that this disease may cause acute meningo-encephalitis Evidence accumulates that infection with this virus is a systemic and not a localized disease. Lymphogranuloma may manifest itself in the following ways involvement of the throat, with tonsillitis, ulceration or angina, fever, with headache and other pyrexial disturbances, skin rashes, various forms of articular involvement, generalized adenitis, with splenomegaly and hepatomegaly, granulomatous conjunctivitis, epididymitis, and meningo-encephalitis In 1941 3 cases of lymphogranuloma in laboratory workers had a septic type of fever, chills and sweats, articular rheumatism, headache, and in 2 cases cervical lymphadenitis, possibly these patients were infected via the upper respiratory tract The diagnosis was based on the history and clinical findings, the positive complement-fixation tests, the positive Frei tests, and, in Case 1, the isolation of the virus from an inguinal gland 5 months after the onset of illness aetiological relation of the virus to the meningo-encephalitic changes was based on the virus infection accompanying involvement of the central nervous system, the meningo-encephalitic signs produced in experimental animals by this virus, the fact that the virus was isolated from the spinal fluid of other patients with the disease, and the negative serological results in tests against other encephalitic-producing virus agents Nevertheless, final proof that lymphogranuloma venereum can cause meningo-encephalitis in man must awart the isolation of the virus from the brain substance in a fatal case and demonstration of histological changes in the brain tissue consistent with those produced by the virus in experimental animals

Treatment.—R O Noom, J L Callaway, and W Schulze<sup>3</sup> prefer sulphadiazine to sulphathiazole in the treatment of lymphogranuloma venereum and chancroid, as drug reactions, especially nausea, are fewer. They treated 10 patients with lymphogranuloma, 10 with chancroid, and 10 with lymphogranuloma and chancroid Half of each group was treated with sulphadiazine and half with sulphathiazole, 6 g. were given on the first day and 3 g daily thereafter for 20 days Chinically, both drugs appeared to be equally efficacious The Frei and Ducrey tests were unaltered at the end of treatment in all cases and were unchanged in 11 patients seen 6 months later.

References —  $^{1}$ Arch Derm Syph 1943, 48, 619,  $^{1}$ New Engl J Med 1944, 230, 567,  $^{1}$ Amer J Syph 1943, 27, 601

# MALARIA AND YELLOW FEVER: SPECIES ERADICATION. (See also Yellow Fever Control)

Sir Philip Manson-Bahr, CM G., D.S.O., M.D., FR CP. Anopheles gambiæ was first discovered in Natal, Rio Grande do Norte, Brazil, in 1930, whither it had been introduced from Dakar, Senegal. The anti-malaria campaign that followed succeeded in keeping it under in Natal, but did nothing to prevent its spread into the interior of the State. The Assie, Mossoró, and Jaguaribe Valleys were invaded, and 1938 witnessed what may well have been the most severe epidemic ever occurring in the Americas, with more than 100,000 cases and 14,000 deaths in the first six months. It may well be that these figures are an understatement; in 1939, 176,000 persons suffering from malaria were treated by the Malaria Service. The trained staff of the Malaria Service of Brazil eventually numbered 4000 workers As regards prevention measures, simple methods of applying Paris green, both wet and dry, pyrethrum spraying, and the 'firt-umbrella' method of Barber and Rice of determining the distribution of species, yielded rapid During the second year the area of gambiæ infestation rapidly diminished, so that since January, 1941, all anti-gambia measures in Brazil have been A cash reward has been offered for finding A gambia, and a large trained staff searches for this species in previously infested and adjacent areas, but none have been found

The history of Aedes ægypti control in Brazil has been equally encouraging Local species eradication of A ægypti has been accomplished in many of the larger cities and even in entire States, and these have been protected against serious reinfestation for years at a time for but a fraction of the expense previously incurred in maintaining 'safe' ægypti indices in a few of the larger cities. The authors suggest that eradication may be equally feasible for these two species in other countries and even for some other species in certain conditions. Amongst the factors which make species eradication feasible are—

- 1 Ease in discovering both aquatic and adult forms
- 2. Efficiency of methods of destroying or sterilizing permanently, or temporarily, all breeding places.
- 3 Opportunity to eradicate the species in a sufficiently large or isolated geographical area so that the periphery, subject to reinfestation from dirty unworked areas, represents but a small fraction of the area worked
- 4 Demonstrated public health and economic importance of species to be eradicated (F. S Soper and D. B Wilson 1)

REFERENCE — "Special Eradication, A Practical Goal of Species Reduction in the Control of Mosquito-borne Disease", J Nat. Malaria Soc 1942, 1, 1

# MASS MINATURE RADIOGRAPHY OF THE CHEST.

W Ernest Lloyd, M.D., F.R CP

The application of mass miniature radiography to large sections of the civilian population must of necessity be a gradual process, but during the past year a number of mass radiography units have been in regular use in different parts of the country and more teams are being trained The pioneer work in this country was carried out by examination of large numbers of His Majesty's Forces, especially in the Royal Navy, and the experience gained thereby has been of the greatest value when the method is applied to civilians. Civilian surveys, however, present many different problems, and a knowledge of the problems and the difficulties likely to be encountered is essential. In a discussion at the Royal Society of Medicine on the organization of a fluorographic service for the civilian community, prominence was given to these problems, and the Report<sup>1</sup> of the meeting merits careful study M Davidson. in opening the discussion, emphasized the silent nature of many cases of pulmonary tuberculosis and that this fact needs to be still more widely appreciated P Kerley maintained that an experienced team can easily handle 1500 cases a week, and that miniature films can be read at a rate of 400 per hour ing of miniature films is only a question of spotting obvious deviations from the normal, but the reading of large films is a problem in differential diagnosis requiring considerable experience. This should only be done by experienced observers, and it is hoped that interpretation will always be done jointly by a physician and a radiologist The causes of tuberculosis detected fall into four (a) the obvious chronic case with extensive fibrosis and cavitation: groups (b) acute cases with cavitation in young adults, (c) old cases with extensive calcification and fibrosis, but showing nodules the age of which cannot be determined by radiography, (d) minimal lesions in young people with no physical signs or symptoms and no certain criteria on which the prognosis can be evaluated, these are referred to as latent subclinical tuberculosis and offer the greatest problem in their disposal D'Arcy Hart discussed the approach to factory workers The objects of the investigation must be fully explained and propaganda is best carried out by shop stewards As the scheme expands, decisions as to the most susceptible groups and at what interval the X-ray examination should be repeated will have to be decided The expansion of the scheme must be combined with rational education on the nature of tuberculosis He was of the opinion that the National scheme should remain voluntary at least for the present R R Trail discussed the necessity for all arrangements to be complete before units start work Among each 1000 of the supposedly healthy probably 4 will require observation in hospital or treatment for pulmonary tuberculosis Adequate beds should be available for such cases and failure to produce immediate treatment will inevitably repercuss on the unit He was of the opinion that the Medical Director of the unit should be carefully selected, and, once appointed, he should be trusted and given the opportunity of following up any suspected cases W A Daley quoted some of the experiences of the London County Council mass radiography unit The capital cost was just under £2000 The cost of maintenance was between £2000 and £2500 a year for staff and £1800 a year for general maintenance, including films and laundry. After examining patients in two mental hospitals, the set had been used for civilians, priority being given to scholars of secondary or technical schools and to civil defence workers ployees of industrial firms were also invited, and in the latter the response varied from 12 to 92 per cent of the staff. In 0 74 per cent the diagnosis was 'probably tuberculosis,' in 0 23 per cent 'cardiovascular and probably nontuberculous lesions,' in another 0 28 per cent 'further X-ray examination needed in a few months,' in 1 per cent 'calcified lesions and no further immediate action necessary.' This I per cent in miniature films compares with 69 per cent of calcified lesions found in large films of student The numbers actually examined by mass radiography varied from 800 to 1500 a week, but even 1000 to 1200 kept the staff very busy. It was estimated that 100 extra sanatorium beds were needed for each set in active use L Banszky did not agree that explanation to the workers is necessary before X-ray examination is carried out. For the last 7 years fluoroscopic examination in employees of one industrial firm near London was carried out in nearly 20,000 workers and not more than 10 had refused examination The radiological investigation was part of the medical examination and was accepted as such by the majority of the workers He emphasized that the examination should be carried out when the worker entered the factory for the first time in order to prevent the employment of any case of active tuberculosis P Ellman doubted whether anyone could be trained in a few weeks or months to take the responsibility of correct interpretation of miniature films, which was as great as, if not greater than, the interpretation of full-sized films In his view, the Ministry of Health might with advantage prepare a panel of examiners who would include an experienced chest radiologist and chest physician working together in order to avoid serious errors Victimization of workers discovered by the method should in no circumstances be allowed to occur, if the scheme were to prove a working proposition the contrary, a system of adequate financial allowances should be instituted to enable treatment to be carried out successfully, together with a scheme for vocational guidance and rehabilitation. He agreed that any scheme for a fluorographic service for the civilian population of the future should be entirely dissociated from existing tuberculosis clinics

One of the most important problems which arises from the discovery of cases of tuberculosis is the patient whose chest radiograph reveals only a small area of infiltration This subject, under the title of "The Management of Minimal Pulmonary Tuberculosis Disclosed by Fluorography", is discussed by W. D W Brooks 2 The author defines minimal pulmonary tuberculosis as that type of tuberculosis which radiographically consists of infiltration without demonstrable cavitation affecting a volume of lung (regardless of distribution) which does not exceed that volume of lung tissue lying above the second chondrosternal junction and the body of the fifth thoracic vertebra on one side Figures are quoted from the London County Council indicating that in 1927 and in 1937 roughly only 20 per cent of cases when diagnosed could be regarded as early cases The application of mass miniature radiography to nearly half a million of the male personnel of the Royal Navy and some 23,000 of the WR.NS has revealed that the percentage of cases of adult type pulmonary tuberculosis was 1 27 per cent in males and 0 91 per cent in females, and of these cases 479 per cent in males and 554 per cent in females were regarded as cases of minimal tuberculosis The therapeutic problem raised by these patients is profoundly modified by two factors The first of these—the existing shortage of facilities of every kind for treatment—it is to be hoped is temporary The second factor is that most of those with minimal pulmonary tuberculosis revealed by fluorography not only feel perfectly healthy but show no evidence of active disease at the most stringent first investigation A total of 2911 sailors were investigated in hospital and the diagnosis of activity was made by assessment of the following evidence history and physical examination, observation of the temperature, pulse, respiration, and weight, hæmogram and repeated estimation of the sedimentation-rate, at least 6 direct sputum examinations including concentration methods, or if these were negative at least 3 cultures of the available sputum, and when sputum was not available at least 3 cultures from the fasting gastric juice. In cases of doubt guinea-pig inoculations of sputum or gastric juice were employed to isolate and identify tubercle bacilli. The mean period occupied by the examination was 10 days Of the 2911 sailors investigated in hospital evidence of activity was found in 16 per cent, in 21 per cent the disease was considered healed, and in 63 per cent, ie, 1826 sailors, the disease was apparently mactive but the stability of the lesions was doubtful. This group constitutes, according to Brooks, the real problem, and the results of further investigation on this group are important. The men concerned were referred to selected shore service and were employed on light duties During a 2-year period of observation. 191 cases of minimal pulmonary tuberculosis developed evidence of activity, and of these 120 became active cases within 6 months and 58 became active from 6 to 12 months after observation. Only 13 cases developed evidence of active tuberculosis after 12 months of observation. It was found that the vounger the patient who has apparently mactive minimal pulmonary tuberculosis the more likely is the disease to present evidence of activity, and, irrespective of age, the longer a patient survives without evidence of active disease. the less likely is it that he will ultimately so relapse. Finally, the author advocates investigations on a statistically significant scale whereby the possible therapeutic effects of such measures as rest in bed, sanatorium treatment, phrenic nerve paresis, and artificial pneumothorax may be evaluated in the hope that one or more of these may sufficiently improve the prognosis for these patients to justify its intensive employment

C H. C. Toussaint and E K Pritchard,3 in an article on "The Early Diagnosis of Pulmonary Tuberculosis", discuss the epidemiology of the disease and maintain that the treatment of tuberculosis must be based on a true clinical conception of the disease They emphasize the fact that in a number of cases the onset is often acute, with rapid spread and excavation, and quote extensively from Rist's4 paper More extensive radiological examination of persons with minimal symptoms is urged and the authors give the results of a pioneer experiment which they have carried out in two London boroughs. Doctors were circulated and asked to send for radiological examination any patient with symptoms which might be due to disease of the lungs, e g, cough, laryngitis, hæmoptysis, and also patients recently suffering from influenza, febrile chill, pleurisy or pleurodynia, or P U O The results are given of 2478 examinations which were carried out between December, 1942, and December, 1943, 80 cases of active tuberculosis were found, divided into the following types · (a) active unilateral disease, 44 cases, (b) active bilateral disease, 25 cases, (c) pleural effusion, 10 cases, and (d) epituberculosis, 1 case In addition, 126 cases of cardiovascular lesions were revealed The authors have evolved a scheme for the early radiological examination of an abnormal symptomatic population group, and they see in it a ripe opportunity for research in which the general practitioner, the tuberculosis officer, and the radiologist may well play leading parts

M M. Scott's writes as one of the general practitioners concerned with the above investigation and gives his experiences in dealing with patients and their "reactions" on being advised to have an X-ray examination of their chest. He is of opinion that the most efficient way of diagnosing tuberculosis in the early stages is by a closer co-operation between the Tuberculosis Officers and the individual general practitioners.

A. Kahan and H G Close, in an article on "Case Finding by Mass Radiography", detail the investigations carried out on 500 naval ratings after a large film had confirmed an abnormality seen in the miniature film (these

sailors form part of the investigation by Brooks detailed above). None of these patients had reported sick. Symptoms were insignificant, and cough, if present, was usually attributed to excessive smoking. In those found to have active disease, close inquiry elicited a history of slight loss of weight and of increasing shortness of breath on exertion as the commonest symptoms. Physical signs in the chest proved of little value in demonstrating early lesions in the lungs, and even in cases with gross radiological changes physical signs were often absent The authors think that perhaps the most important lesson to be learnt from mass radiography is that extensive and increasing disease of the lungs may be present without clinical signs and without sym-In only 27 of the 138 cases diagnosed as having active tuberculosis was the erythrocyte sedimentation-rate higher than 10 mm in one hour Laboratory findings are given prominence and more extensive culture of the sputum when direct examination of sputum proves negative is advised (6 per cent sulphuric or 4 per cent hydrochloric) were used for concentrating the sputum and Lowenstein-Jansen medium was used for cultures The tubes were examined at weekly intervals and discarded after 5 weeks if no growth had appeared For examining the stomach contents the fasting contents were aspirated by means of a Ryle's tube. It was rare to find a sailor who was unable to tolerate the passage of the tube In 6 of 69 bacteriologically positive cases bacilli were found only in the gastric aspiration. In 22 of 500 cases non-tuberculous pneumonitis was diagnosed The X-ray opacity was seen usually in the middle or lower zone and was of variable size and with well-defined edges The opacity resolved in the course of a few days or a few weeks. One case resolved within a week, the longest took 19 weeks The erythrocyte sedimentation-rate was raised in practically all the cases, and a history of a cold or a mild cough was obtained in all the patients just before the radiograph was taken

In the 1944 Medical Annual, reference was made to the Advisory Report on the Working of a Mass Radiography Unit published by the Ministry of Health. Supplements' to this report have been published, the first of which refers to the interpretation of radiographs, and the following are some of the recommendations made (a) A calcified primary complex should be ignored, (b) Thickened pleura should be ignored unless a parenchymatous lesion is visible; (c) If a large film suggests complete healing (calcification of all visible foci), no further investigation is necessary. If the large film suggests tuberculosis of the adult type and the observer is unable to decide whether the disease is healed, quiescent, or active, the following procedure (dependent on the age of the patient) is recommended and should be carried out by the Tuberculosis Officer in association with the patient's own doctor—

1 For persons below 30 years of age (a) Lesions with calcification and fibrosis and doubtful recent foci should have full clinical investigation. If these investigations are negative, it is desirable that clinical and radiological reassessment should be carried out at such intervals as the Tuberculosis Officer in each case may think fit—if possible at intervals not longer than six months—for two years. (b) If there are uncalcified lesions with little evidence of fibrosis and the result of adequate clinical investigation is negative, it is desirable that clinical and radiological reassessment be carried out, if possible, at intervals not longer than three months, as a high percentage of this type break down without premonitory symptoms

2 For persons over 30 years of age. Lesions showing extensive calcification and fibrosis should have one complete clinical investigation, and if this is negative it is desirable that clinical and radiological reassessment be carried out, if possible, at intervals not longer than one year, for three years. If the

radiological lesion is in any way suggestive of infiltration or cavitation, periodic observation as advised for persons under 30 years is desirable

8 The radiological demonstration of enlarged bronchial or mediastinal glands, with or without a visible parenchymatous lesion, demands full investigation. As the lesion may be carcinoma or some other non-tuberculous condition, the value of early bronchoscopy should not be overlooked.

A second supplement gives standards for positioning and exposure for large films. It is recommended that in all suspicious cases of early tuberculosis AP as well as PA views should be taken. Suitable technical factors for both large and small films have been worked out and are now being incorporated in a book of instruction which is sent out with each unit

A third supplement gives the classification of diseases and abnormalities of the chest to be used in mass radiography investigations

Although sufficient experience has been gained to prove that in mass miniature radiography a method of investigation is available which will detect many cases of tuberculosis in apparently healthy subjects, the scheme has its J F Brailsfords condemns the method and describes it as an antisocial measure which could never have been adopted had full criticism been permitted at a time free from the panic of war He maintains that the skilled personnel and equipment necessary to radiograph the whole of the population is not available, and that the examination must be repeated at intervals if it is to be successful Many controversial points are raised, and he asserts that a person may be spitting tubercle bacilli and yet have a normal chest radiograph, and that a patient may have clinical signs and symptoms of pulmonary disease and have a normal radiograph Brailsford thinks that there is a tendency in clinicians to treat the patient's radiographic appearances which they think they understand rather than the patient's clinical condition which has not been investigated. He asks if mass radiology of the lungs, why not mass examination of the sputum, as by so doing the important sputum-positive cases would be discovered He thinks mass radiography units should be used for the examination of the suspected, the repeated examinations of the contacts, and the men engaged in occupations liable to mure their lungs

E W E Hoffstaedt<sup>9</sup> also criticizes mass miniature radiography and thinks that the present method is uneconomic and that it should be used in the investigation of cases with chest symptoms and in the more systematic examinations of contacts That would be possible only by the use of mobile units X-ray-negative cases, if the symptoms did not subside, and all X-ray-negative contacts should be re-X-rayed after three and six months, and this routine re-examination, not provided for under the official scheme, he considers is of paramount importance B C Thompson<sup>10</sup> comments on the criticisms, and writes as a Tuberculosis Officer who has had considerable experience in mass miniature radiography He does not believe that a person with tubercle bacilli in the sputum can have a normal chest radiograph. It is a well-recognized fact that a number of cases of early tuberculosis recover spontaneously, but because a number do so is not an argument that all will do so, and Thompson does not agree that an anxiety state is induced in patients when told that they must be kept under observation He concludes by saying "We can afford to neglect no weapon, least of all one so tried and true Let us see that it is used to the full "

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#### MEASLES.

Thomas Anderson, MD, FRCP.Ed Epidemiology.—376,104 cases of measles were notified in England and Wales during 19431 The disturbance of the measles periodicity which occurred at the beginning of the war would seem to be settling and the normal two-yearly rhythm beginning again to assert itself In 1941, 409,000 cases were notified, the figure falling to 286,000 in 1942 Mortality remains low, for only 778 cases died in 1943 It must be remembered, however, that this mortality is concentrated in the youngest age-groups

Prophylaxis.

- 1 Measles Virus -- As was indicated in last year's Annual. work on this subject, although still largely experimental, continues to give promise Geoffrey Rake<sup>2</sup> has extended his observations upon the effect of the material obtained from culture of the virus on the chorio-allantoic membrane of fowl embryos when inoculated into children, 1281 injections have now been made without undesirable effect Of the total, 839 have been followed up and 54 per cent of these developed a mild measles Whether this will result in a conferred immunity is still uncertain, for 10 out of 24 such children subsequently developed measles after the moculation of proved infective measles blood. Such an inoculation, of course, might be expected to be more liable to infect than the more casual encounter of daily life A further 22 children were intimately exposed to the disease in the natural way, 4 developed measles, 8 were doubtful, and 15 remained well When 85 susceptible children (un-inoculated) were exposed to children who had taken measles as a result of inoculation, 18 of them developed recognizable measles 
  In other words, passage of the disease had not lowered the capacity of the virus to cause infection
- 2. Convalescent Serum —M Stillerman and his associates discuss the important factors which need to be understood in assessing the protective power of a convalescent serum 
  Even without preventive inoculation a certain proportion of any population at risk will always escape infection, in addition, such personal factors as the age, duration, and intimacy of the exposure are obviously important, and when serum is used the further factors of dosage and interval between exposure and infection must be borne in mind The authors studied the behaviour of 245 contacts who had not received convalescent serum was found to be of importance, for in those between 6 and 11 months one-third did not develop measles, between 1 year and 7 years 10-14 per cent escaped, between 8 and 9 years 81 per cent were immune, and of a small number between 10 and 15 years, 85 per cent were immune Among 502 children given convalescent serum only 5 developed the unmodified disease and one-half were completely protected They found no significant difference between the results obtained when the serum was injected at any time between the fourth and seventh day of exposure But serum given on the eighth day was unlikely to prevent, although it usually has a definite modifying effect. For complete protection they recommended the injection (after 4-7 days' contact) of 10 cc at ages 6-11 months, 15 cc up to 2 years, and 20 cc for those 2-8 vears of age

[Such doses are much higher than those recommended in this country (see W Gunn4).-T. A]

In a further paper in the same journal these authors record the attack-rates of 266 intimately exposed family contacts between 1 month and 14 years of age Over all the secondary attack-rate was 75 per cent The rate was lowest in early infancy, highest for those between 1 year and 7 years, and lower again for those between 10 and 14 years Removal of the primary case to hospital after the appearance of the rash did not affect the rate The incubation period of 80 per cent of the contacts was between 10 and 14 days, and in 14 per cent It was between 15 and 19 days. There was a tendency for children between 12 and 28 months to show a slightly longer incubation

References.—¹Rep M:n Hlth 1944, ¹J Pediat 1943, 23, 876, ¹Amer J Dis Child 1944, 67, 1, 15, °Control of Common Fevers (Lancet Publ ), 1942, 162

Sir Philip Manson-Bahr, CMG, DSO, MD, FR.CP. MELIOIDOSIS. A very curious chronic case of this rare Malayan glanders-like infection with bone and pulmonary lesions has been described in a British soldier by J. H Mayer and M H Finlayson <sup>1</sup> The illness commenced insidiously 20 months after arrival in Singapore, with lumbosacral pain radiating down both thighs. One month after, he had irregular pyrexia, night sweats, stiffness of lumbar spine, and some enlargement of the inguinal glands In the early stages laboratory examination revealed nothing but a raised blood sedimentation rate, so that a provisional diagnosis of spondylitis was arrived at, but later in January, 1941, a lumbosacral abscess developed, to be followed during the next 18 months by abscesses in the sacro-iliac joints, 8th dorsal vertebra, and the right hip-joint In May, 1942, radiography of the chest showed extensive infiltration of the right base, hilar enlargement, and bilateral apical pleural thickening The diagnosis then suggested tuberculous sacro-iliac arthritis, but examinations for Myco tuberculosis were negative. In March, 1943, the patient was transferred to South Africa, and in the next month Pferferella whitmori was isolated in pure culture from pus from an abscess in the right thigh and the patient's serum agglutinated this organism 1-500 Earlier in the disease sulphapyridine had been tried without effect, and the patient was started on a vaccine made from the causal organism, with the first dose of 10 million, and his condition commenced to improve.

The organism was typical of *P whitmori* and was in the smooth phase when first obtained. The authors noted that acid-fast granules could be demonstrated by staining with carbol fuchsin and decolorizing with 10 per cent acetic acid. In old broth cultures the acid-fastness of these granules, both inside the bacilli and free, became more pronounced, but they were readily decolorized by alcohol. The patient did not react positively to subcutaneous injection of 0.2 c c. of a 1-10 dilution of mallein

It is no longer possible to assert that mehoidosis is confined to half-starved indigent natives, because an almost identical and parallel case, also in a British soldier, was described by A Grant and C Barwell<sup>2</sup> in 1948. This man had served 3 years (1935-8) in the country in Malaya and a short time in Penang. The first phase of the illness was distinguished by arthritis of the right ankle in May, 1938; the second phase by bilateral bronchopneumonia in June, 1941; thereafter he suffered from arthritis of the right hip-joint, urethrorectal fistula, swelling of the parotid, osteomyelitis of the frontal bone, and finally abscess over the left external malleolus from which *Pfeiferella whitmori* was isolated. The case was eventually correctly diagnosed in an EMS hospital on the return of the patient to England.

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MENTAL DISORDERS. (See also Neuroses and Psychopathology; Social Aspects of Psychiatry, War, Psychiatry of.)

MENTAL DISORDERS IN CHILDREN.

Aubrey Lewis, M.D., F.R.C.P.

The causation of psychoses occurring in children and early adolescents has been studied less than in adults E. C. Yerbury and N. Newell¹ took 56 children in mental hospitals who had been of normal intelligence before their illness began. These were compared with an equal number of average children

of the same age and sex. The psychotic children, it was found, had come from most unsatisfactory homes, where they had been cruelly treated or otherwise mishandled, the parents had sometimes set standards far too high for the child's attainment. There were no more instrumental or difficult births among these children than among the normal ones. Emotional upsets had, however, contributed significantly to the mental breakdown these included bereavement, upbringing by insane parents; sexual guilt or assault, incest, and pregnancy

E Froschels' re-examines the problem of psychic deafness in children—a rare condition—Froschels is not willing to regard this as a hysterical disorder, and considers that the basic trouble probably lies in a slight defect of Heschl's convolution—He proposes to name it "central deafness".

M. D. Sheridan<sup>3</sup> draws attention to the danger that children with high-tone deafness will be wrongly assumed to be mentally defective. She quotes illustrative cases and emphasizes that skilled audiometric examination is necessary wherever this possibility is suspected. Any child over the age of 7 who shows a persistent defect of articulation should be seen by a medical officer skilled in audiometry and phonetics.

A T Ross and W W Dickerson<sup>4</sup> have examined 25 patients with tuberose sclerosis (epiloia), and they describe diagnostically significant X-ray findings in the skull, viz, patchy zones of increased density usually situated in the upper half of each parietal bone, and partially calcified nodular lesions in the region of the basal ganglia or around the third ventricle, the former were observed in 48 per cent of their patients, and the latter in 80 per cent; 6 of their patients had intra-ocular tumours arising from the retina, such as had been earlier described by H. C Messinger and B. E. Clarke <sup>5</sup>

J Lichstein and L Solis-Cohen<sup>6</sup> have seen two patients, a father and a son, with epiloia, in whom there was no adenoma sebaceum. There could be no doubt as to the correctness of the diagnosis, they had multiple cerebral calcifications, epileptiform seizures, and a confirmatory family history. The younger patient was mentally defective, and a pneumo-encephalogram showed focal areas of cerebral atrophy in the right parietal region. According to Lichstein and Solis-Cohen the calcified deposits were situated within the ventricles and not, as Ross and Dickerson<sup>4</sup> observed, in the calvarium R. M Stewart<sup>7</sup> reported the condition in a woman 21 years old, and of normal intelligence, who had no adenoma sebaceum; R. L. Drake<sup>8</sup> also reported such a case.

D W. Winnicott and C Britain<sup>9</sup> have treated in evacuation hostels a number of children who could not settle in billets. Some of these children had severe neurotic symptoms, but nearly all responded well without individual psychotherapy and became able to enter home life again. Winnicott and Britain make a number of suggestions in regard to the proper management of such hostels, which they consider can be of therapeutic value in providing "substitute homes." An official publication dealing with the same matter has been issued by the Ministry of Health.

A number of writers have now reported abnormal electro-encephalograms in children whose behaviour was unsatisfactory so that they needed psychiatric attention C I Solomon, W. T Brown, and M Deutscher<sup>11</sup> rightly point out that most of these studies lacked the confirmation to be derived from careful comparison with a group of normal children, even in those investigations which had used a normal group for companison, the only factor which had been controlled to ensure comparability was chronological age. The authors chose groups similar in as many factors as possible apart from their unsatisfactory behaviour. From a junior high-school class of 131 they took the 20 best behaved and the 20 most troublesome The boys were between 13 and 16½

years old and had similar social, economic, and cultural backgrounds not only at school that the differences in behaviour had been observed, but also at home and in the neighbourhood There was no significant difference in the frequency of abnormal electro-encephalograms in the two groups (12 in one-The 10 best behaved lads in an institution for group and 11 in the other) delinquent boys were then compared with the 10 most severe and chronic delinquents there. Four of the former and nine of the latter showed abnormal tracings Abnormal electro-encephalograms were found most consistently in the worst behaved members of this group of delinquent boys, so that it may be inferred that an abnormal cortical tracing is indicative of a physiological disturbance which hinders satisfactory adjustment But the authors insist that in an individual child it would be wrong to give much weight to an abnormal electro-encephalogram, except when it indicates epilepsy, cerebral dysrhythmia should be regarded as merely a probable unfavourable factor, among many others, which may be at work

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35, 681, "New Era, 1944, "I'-Hostels for "Difficult" Children, HM Stationery Office, 1944, 
"Amer J Psychiat 1944, 101, 51

#### MENTAL DISORDERS: CONSTITUTIONAL ASPECT

Aubrey Lewis, MD, FRCP

Fresh impetus has lately been given to the study of physical and mental constitution by the work of W H Sheldon 1 In spite of the valuable contribution made by E Kretschmer<sup>2</sup> to this topic, methods which seemed adequate twenty years ago, when he put forward his views, are now judged too inexact Statistical techniques have therefore been applied in various and uncertain ways to the problem W L Rees' reports the results of a factorial analysis of physical measurements taken on 200 soldiers admitted to a neurosis centre It was found that two factors would account for all the correlations-one of - these was a general factor influencing body size or growth, and the other determined the body type Stature and transverse chest diameter were the measurements which had the highest saturation with the opposite aspects of the type factor An index incorporating these two measurements was found to be useful for objectively discriminating three physical types, called leptomorph, mesomorph, and eurymorph Among patients with 'effort syndrome' leptomorph habitus was more frequent than among normal persons of the same age and sex, those patients with 'effort syndrome 'who had eurymorphic physique were mostly men with recent symptoms provoked by febrile illness or other severe external stress. In another group of neurotic patients, hysterical symptoms were found to be more frequent among eurymorphs, and anxiety and depression among leptomorphs. In a group of insane patients it was confirmed that manic-depressive patients were more eurymorphic and schizophrenics more leptomorphic than normal persons

In an ingenious report E T O Slater and P Slater suggest possible views about the nature of neurotic constitution and propound a theory that it is preponderantly determined by a large number of genes, each of which has small effect, but which collectively may produce a reduced resistance to some environmental stress, thus facilitating the development of a neurosis. In so far, however, as the effects of these genes are qualitatively dissimilar, different types of stress will produce breakdown and different neurotic symptoms will be produced. They conclude that a neurotically predisposed person is only one of the extremes of normal human variation.

Many traits are, on slender evidence, called neurotic and regarded as indicating constitutional instability L. A Pennington and R J Mearin<sup>5</sup> ascertained the frequency of such mannerisms, etc., among more than 2000 recruits to the Navy. Particular regard was paid to nail-biting Approximately a quarter of the recruits bit their nails, and it was found to be by no means an index of abnormality which need be taken seriously. This is in keeping with a number of other studies that have been made to determine whether 'nervous' habits deserve to be regarded as symptoms. Thus H L Koch<sup>6</sup> and W Olsen<sup>7</sup> have shown how frequent such habits are in normal children. It is, of course, the case, however, that among nail-biters, particularly those who do it incessantly, many tense psychopaths are to be found.

F C Thornes has similarly examined the incidence of nocturnal enuresis after the age of 5 Among 1000 consecutive conscripts it was found that 16 per cent had gone on wetting the bed past the age of 5, and as many as 25 of the 1000 had not gained control until they were 18 years old or more There were associated psychiatric symptoms in nearly two-thirds of those who complained of enuresis

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#### MENTAL DISORDERS IN OLD AGE. Aubrey Lewis, M D, F R C.P.

In spite of the growing interest in senile disorders, few reliable statistics have been published in this country about senile psychoses. This is, no doubt, partly due to the difficulty of distinguishing between semile psychoses superimposed on other mental illness, and those that occur in previously healthy persons F Post1 has analysed the patients over the age of 60 who were admitted to the Royal Edinburgh Mental Hospital between the years 1903 and 1942 They reflect the changes in the age composition of the general population, but the latter does not wholly account for the steady rise which was exhibited during this period in the aged admissions Out of 240 patients over 60 admitted since the beginning of 1937, 125 showed senile or arteriosclerotic dementia, and 58 suffered from involutional or senile melancholia One-fifth of the elderly patients admitted to one section of the hospital could later be discharged to the care of their families, this is in keeping with the findings of H D Palmer, F J Braceland, and D W Hastings2 in Philadelphia The outcome was much more favourable, Post found, in arteriosclerotic than in semile psychoses He believes that most such cases can be easily classified as either arteriosclerotic or senile [But this is very questionable -A. L] Like earlier writers Post found that the previous personality of these patients had not been satisfactory, 62 per cent of the patients about whom information was available had shown psychopathic aberrations of some sort

One of the difficulties in determining the effect of any therapeutic measures on senile deterioration is that it is hard to assess the degree of dementia objectively at any stage of the patient's illness H Babcock's's valuable contribution to the task of measuring mental deterioration has, however, lately been applied by several investigators to semile dementia H Halstead's gave 25 mental tests to a number of demented patients between 70 and 83 years of age He concluded that deterioration cannot be assessed by "short-cut methods"

D Rothschild, 5, 6 carrying further his numerous studies of psychoses of advanced age, has looked into the pre-morbid personality of those with insanity due to cerebral arteriosclerosis, 7 and he concludes that individuals who are in any way handicapped psychologically are more vulnerable to arteriosclerotic

psychoses. The anatomical changes in such patients are not all-important in determining whether they will become insane

W Norwood East<sup>8</sup> collects much hitherto scattered material concerning the relationship of crime and old age. During the period 1911 to 1928 the incidence of indictable crime diminished more in men over 60 than in any other adult age-group, for every main class of crime except forgery and offences against currency, but in 1928 there was a large increase in the age-group 50 to 60 After a full review of the official statistics, however, East concludes that on the whole they throw little light on the mental background associating crime with senescence and sensity. He then examines this mental background very lucidly in the light of his experience.

REFERENCES — J ment. Sci. 1944, 90, 554. \*Amer J Psychiat 1944, 99, 857. \*Time and the Mind, 1941, Cambridge, \*J ment Sci. 1944, 90, 720, \*Arch Neurol Psychiat 1942, 48, 417. \*Diseases of the Nervous System, 1941, 2, 49, \*7Amer J Psychiat 1944, 100, 501, \*J ment Sci. 1944, 90, 836

### MENTAL DISORDERS: PHYSICAL CHANGES IN.

Aubrey Lewis, M D , F R.C P

F W Mott's1 findings and those of other investigators regarding changes in the testicles in schizophrenia had gradually ceased to be regarded as valid R E Hemphill, M Reiss, and A L Taylors raise the question in a new form. and instead of taking material obtained post mortem they use the method of Small pieces of testis were taken from 90 patients with schizophrenia and 25 with other mental disorders. In many of the schizophrenics atrophy was observed in the seminiferous tubules, with hyaline degeneration of the basement membrane and arrest of spermatogenesis Sclerosis of smaller vessels was common; there was relatively little interstitial fibrosis Hemphill and his colleagues hold that the atrophy which they observed in their schizophrenic patients differed essentially from that caused by systemic affections or senility Hemphill<sup>3</sup> found that the severest atrophy was associated with chronic forms of schizophrenia, but not with the paranoid form Severe atrophy could occur also in early cases, if they were malignant. There was no relationship between the excretion of 17-ketosteroids and the degree of degeneration observed in the Hemphill believes that the testicular disorder is not the cause of schizophrema, but is itself due to a complex central imbalance

Light was thrown on the much disputed question of the cerebral changes in functional psychoses by the study of A R Elvidge and G E Reed in 1938. They took specimens of living brain and were thus able to carry out a biopsy which apparently revealed swelling of the oligodendrogha cells in schizophrenic and manic-depressive psychoses. P. Polatin, V. W Einstein, and S E. Barreras have lately carried out a biopsy of the brains of two patients under treatment for schizophrenia. Although the clinical picture was typical, an electro-encephalogram had suggested pathological changes in the brain, and an air encephalogram indicated that there was some cerebral atrophy. The biopsy material from the cerebral cortex showed irreversible changes of a degenerative nature

W R. Kirschbaum and G. Heilbrunn<sup>6</sup> have examined histologically biopsy specimens from the pre-frontal cortex of patients with chronic schizophrema, the opportunity arose when the patients were to have a frontal leucotomy performed. Degenerative changes in the ganglion cells and reactions of the glia and blood-vessels were observed, such as are commonly seen in chronic intoxication and metabolic disorder. Since these changes might have been due to the ether used for anæsthesia during the operation, the brains of two young non-schizophrenic patients who had died during abdominal operations performed under ether were compared with them, animal experiments were also

carried out Like Elvidge and Reed, the authors concluded that the changes observed could not be attributed to ether

The functional activity of the parotid gland has been given a notable place in physiological psychology by the work of Pavlov Surprisingly little has been done, however, to utilize this activity for the study of autonomic function in human beings E I Strongin and L E. Hinsie' published striking observations, from which it appeared that manic-depressive patients showed considerable abnormality in the quantity of saliva secreted from the parotid gland observations tended to show that this could be used as an indicator of the patient's clinical improvement as well as an aid in the differentiation of reactive types of depression from more constitutional recurrent types To test this further, H J. Eysenck and P M Yapp<sup>8</sup> have studied parotid secretion in 100 patients, divided equally between the two sexes, of whom the majority had been referred to a neurosis centre for affective disturbance in which anxiety as well as depression was conspicuous. Various psychological stimuli and tests were applied during the period of observation. It was found that salivary secretion was less in the neurotic patients who showed anxiety and depression than among hysterics. A group of more severely depressed patients who were under treatment in a mental observation unit secreted less than did schizo-It was also found that salivary secretion decreased during concentrated mental work

P C Baird<sup>a</sup> administered to some adrenalectomized cats citrated blood from patients suffering from acute mania, and showed that they survived much longer than similarly adrenalectomized cats to which citrated blood from healthy persons had been administered. Similar experiments were carried out with rats, those who received manic blood not only lived longer but are said to have shown unusual strength and appetite. It would be premature to attempt to interpret these findings.

M Ekblad<sup>10</sup> decided to apply to manic-depressive psychosis the method introduced by H O Lagerlöf<sup>11</sup> for investigating pancreatic secretion by means of secretin As Lagerlof had considered that individual differences in the enzyme content of the pancreatic secretion might be due to variations in vegetative nervous activity it was thought that abnormalities would be found in melancholia The findings, however, were wholly negative and did not vary when the clinical state of the patient improved

In earlier series of reports H. E. Himwich and J F. Fazekas¹² have published the results of studying the cerebral arteriorenous oxygen differences associated with various forms of mental defect, they compared arterial blood with internal-jugular venous blood, and with blood from the fontanelle. In a further study¹² they extend these observations to patients with amaurotic familial idiocy, hydrocephalus, and microcephaly. They find the oxygen differences are high in patients with amaurotic familial idiocy, but normal for those with microcephaly and hydrocephalus, and that above the age of 20 years patients with mongolism, cretinism, and phenylpyruvic oligophrenia have a lower arteriovenous oxygen difference in the brain than do persons with mental deficiency not attributable to any specific disease. Himwich and Fazekas conclude that cerebral metabolism is reduced in mentally defective persons.

E. S Gurdjian, W E Stone, and J. E. Webster<sup>14</sup> undertook experiments to determine the effects of varying degrees of hypoxia on cerebral metabolism in animals. Below a critical level of 11 to 13 per cent of oxygen in the air breathed, cerebral lactic acid increased as the supply of oxygen to the brain fell. The level of lactic acid in the brain was independent of that in the blood. Phosphocreatine broke down in the brain below a critical level of 7 per cent oxygen in the inspired air. If the period of hypoxia was prolonged up to one hour,

instead of the usual fifteen minutes employed in the experiment, the extent of the chemical changes was not affected by this If room air was breathed by the animals after severe hypoxia, it took about ten to forty-six minutes for lactic acid to fall to normal, according to the percentage of oxygen breathed

- D Hill<sup>15</sup> has described further the significance of cerebral dysrhythma disclosed by the electro-encephalogram in psychopathic persons who are aggressive. Expanding the views expressed by him and D Waterson<sup>16</sup> two years earlier he presents evidence in support of the view that there is a kinship between such patients and epileptics. He holds that there is in these aggressive psychopaths a disturbance of function in the thalamus and hypothalamus or in circuits of neuronal chains connecting the two. Hill illustrates the difficulty of distinguishing between outbursts of epilepsy and psychopathic aggressive behaviour by means of two criminals whom he had examined, and he discusses the likelihood that severe impairment of consciousness would accompany the attacks described
- J. Romano and G L Engle<sup>17</sup> have tried to investigate the departures from physiological normality in delirium by means of electro-encephalography, together with special psychological tests [The authors' conception of delirium enables them to include cases in which the typical anxiety, motor restlessness, disturbed thinking, and perceptual errors of pronounced delirium were not present—A L] All their patients who had disturbed consciousness had an abnormal electro-encephalogram, the character of which was directly related to the intensity, duration, and reversibility of the causes which had brought about the delirium. In several patients treatment of their physical disability resulted in improvement in the electro-encephalogram, though it did not completely revert to normal. The authors state that adrenal cortical extract, in amounts large enough to produce a change in the dextrose tolerance curve, effected further improvement in the electro-encephalogram.

Electro-encephalographic studies by M Greenblatt<sup>18</sup> have indicated that among neuro-psychiatric illnesses the senile and arteriosclerotic psychoses are those most frequently associated with an abnormal electro-encephalogram When the incidence of electro-encephalographic abnormalities as a function of age is looked into more closely, it appears that the relationship is a hyperbolic curve with greatest abnormality in youth and old age. Greenblatt holds that the variations in electro-encephalographic findings associated with age are sufficient to account for many of the differences formerly attributed to different psychoses, which tend to occur during particular age periods. (Cf Mental Disorders in Children)

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## MENTAL DISORDERS: TREATMENT. Aubrey Lewis, MD, FRCP

- J. Fuster<sup>1</sup> has treated schizophrenia by combining induced pyrema with convulsant treatment Colloidal sulphur was given intramuscularly and while the temperature was raised in consequence a fit was electrically induced. In his small series of cases, one-third did better than would ordinarily have been judged likely.
- W W. Jetter<sup>2</sup> describes his observations in three patients who died after electric convulsant treatment. He emphasizes the danger of administering electric fits to patients with heart disease or to persons in whom there is any reason to suspect unusual susceptibility to disturbance of the centres controlling vasomotor and cardiac function.

The latest evaluation of the effect of frontal leucotomy by W Freeman and J. W Watts<sup>3</sup> refers to 170 patients 154 were hving after an interval varying from six months to seven years after the operation, 16 had died, 4 from the operation and 2 from suicide Of the 154, 25 are regularly employed, 6 are partly employed, and 30 look after their homes, 27 others are at home, and only 12 are still in an institution The results were estimated to be on the whole good in 65 per cent of the cases, and fair in 21 per cent The authors' criterion of a good recovery is, however, a relative one, thus they classify the outcome in that way if a schizophrenic is able to live at home in idleness after having been chronically excited, aggressive, and resistive in the mental hospital The patients after operation may still have their delusions and hallucinations, but are less preoccupied by them According to Freeman and Watts the schizophrenics are often dreamy, without initiative and "content with their status of domestic pets" after operation Severe degeneration of the nucleus medialis dorsalis of the thalamus occurs, and the fibres connecting the thalamus with the frontal lobe are found post mortem to have been completely severed Freeman and Watts sum up the effect of the operation by saying that it " bleaches the affect attached to the ego "

In a preliminary report, R G Heath and F Powdermaker<sup>4</sup> suggest that ergotamine tartrate will combat the sympathetic over-activity which occurs in anxiety, and thus may be an adjunct to other methods of dealing with this condition in Service cases. They used it first to overcome the effects of injected adrenaline, as it was found efficacious for this purpose it was given orally, in an initial dose of 3 mg and thereafter 2 mg every three hours, for 10 days to 20 patients with "battle reactions" and 20 other neurotic patients who had no pronounced sympathetic manifestations. The former reported benefit and the latter did not

Many drugs have been used to induce narcosis in psychiatric patients, especially those with some psychogenic disturbance of memory C H Rogerson<sup>5</sup> believes that for this purpose *introus oxide* has advantages which cannot be derived from barbiturates, it is quicker, simpler, and safer. During the period of induction gentle suggestions are given telling the patient that he is becoming relaxed, and that painful ideas will come up more readily. When his grip on the mask relaxes he is urged to express whatever comes into his mind. C Lambert and W. L Rees<sup>6</sup> have used barbiturates for this purpose in 126 Service patients with hysteria. They believe that the main advantage in the method over other psychotherapeutic procedure is that it saves time, especially in bringing to an end hysterical forgetfulness, but they find that the degree and completeness of recovery is no better than when other psychiatric methods are employed.

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MIDWIFERY, CONTINUOUS CAUDAL ANÆSTHESIA IN. (See Continuous Caudal Anæsthesia in Midwifery)

MIDWIFERY, LACERATION OF THE PERINEUM AND THE USE OF EPISIOTOMY IN. (See Laceration of the Perineum and the Use of Episiotomy in Midwifery)

MIGRAINE. Macdonald Critchley, M.D., F.R.C.P.

To the very large number of remedies which have at one time or other been vaunted in the management of cases of migraine, a new régime has been added In view of the frequency of this affection, its common resistance to treatment,

and its disabling nature at times, any newcomer in one's armamentarium is welcome

N Leyton¹ has used for several years a course of injections of anterior ptuntary-like hormone  $(A\ P\ L)$  obtained from pregnancy urine which contains mainly a luteinization factor (antuitrin-S). If the patient does not respond and can be shown to be sensitive to an intradermal injection of histamine, the treatment is combined with desensitization measures, either by histamine, or—better—by oral prostigmin

The details of this régime are as follows. A small test injection of the hormone (25 international units) is given. This should preferably be given just after the end of a menstrual period, if the patient is a female between the menarche and the menopause. If no nausea or ovarian pain result, the injections are continued on alternate days, the dosage increasing by 50 units each time, until a maximum of 450 units to a single dose is given. By this time the total amount administered will have been 2275 units, and the next period will be due. Injections are thereupon withheld until menstruation has ceased, and then 450 units are given twice a week for the next month. Many patients will have improved already. In some cases it is advisable to continue the injections once or twice a week for the next three months, giving 500 units at a time.

Another intensive course of injections may be required at the end of six months, or sooner if the patient's migraine should have flared up again, either spontaneously, or as the result of mental stress or intercurrent illness

When patients do not respond to this treatment, it is well to test for sensitivity by injecting intradermally 0 1 c c of a 0 1 per cent solution of histamine acid phosphate. An area of erythema, three to four inches in diameter, constitutes a positive reaction. In such cases, a course of prostigmin desensitization is started. A 15-mg tablet of prostigmin bromide is dissolved in 2 oz of water. Starting with 2 drops of this solution in a little water, the patient increases the amount by 2 drops each dose, twice a day, until 60 drops constitute the dosage. At this point the patient continues to take 60 drops once a day on alternate days for a fortnight. This régime may have to be repeated later.

Special points in the technique need emphasis -

- 1 A very very few patients are extremely sensitive even to small doses of the APL hormone, and respond with abdominal pain, nausea, and perhaps with an attack of migraine. Hence the initial dose must be the small one of 25 units. If an injection in the increasing series produces this reaction, one should return to the last dose that could be given without ill-effect. The injections may even have to be maintained as low as 10 or 15 units.
- 2 With the larger doses, 1 e, 100 units or more, it is better to use the more concentrated preparation of antuitrin-S, as large amounts of fluid are painful The gluteus muscle is usually preferable to the triceps even for the smaller injections.
- 8 An interval of six weeks should always follow a three-month course of A.P.L. injections, otherwise antihormones may be produced, with a return of migraine

It is a pity that the author did not give figures as to the total numbers treated, or the length of time over which his series has been followed. He states, however, that about 60 per cent gave completely successful results, and in 30 per cent attacks became milder, shorter, and farther apart. In 10 per cent there was no benefit. Often the general health improved as well.

Males, as well as females, show the same satisfactory results.

REFERENCE -1 Med. Pr 1944, 211, 802

MORBIDITY: MEASUREMENT OF. (See also Neonatal Morbidity and Mortality, Vital Statistics)

Ralph M F Picken, MB, ChB, BSc, DP.H.

P Stocks1 has described systems of classifying diseases for the purpose of sickness, as distinct from death, records, the collection of such records and their analysis, and has made suggestions for securing more complete and comprehensive data of this kind Efforts in this direction have been made for a number of years by the Department of Health for Scotland in connexion with the insured population and in Canada for Civil Service personnel. The Medical Research Council has issued a Provisional Classification of Diseases and Injuries2 built on the framework of the International List of Causes of Death, which is now used in tabulating the records of EMS hospitals and other health organizations The system is elaborate and detailed, but Stocks gives a short list of 42 headings which may be convenient for giving a quick impression of the types of case treated in hospitals He discusses, with illustrations, how such statistics may be handled to reveal differences due to locality, seasonal or secular trends, and age- and sex-distribution It is probable that standardization for age and sex will be necessary if statistics from different hospitals are to be strictly comparable, in any case hospital statistics are too selective to give a true picture of the incidence of sickness in a civilian population The method of survey which has been much used in America and is now practised in England through the War-time Social Survey, and which involves visitation of random samples of the population and inquiry as to illness by trained interrogators, does give satisfactory data. Some of the results have been published in successive issues of the Monthly Bulletin of the Ministry of Health and in the Ministry's Annual Report 3 In this paper Stocks shows that the findings from period to period are consistent for serious and moderate to mild illness and for ill-defined symptoms For some conditions, such as mild influenza and colds, the recollection of patients is less reliable, pointing to the advantage of fairly frequent inquiry relating back to a short period of time He points out, however, that cross-sections of the population alone cannot give complete answers to some of the problems of the aetiology and prevention of chronic diseases which may be traced to events occurring in early life therefore advocates and outlines a system of continuous individual health records from birth at least up to the age of fifteen

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MOUTH AND JAWS, CARCINOMA OF. Lambert Rogers, MSc, F.RCS
Recent advances in the treatment of carcinoma of the mouth and jaws are
well summarized in a paper with this title by T A Somervell, of Travancore,
Southern India In the coastal districts of South India and Ceylon, epithelioma of the mouth, including the tongue, jaws, cheeks, and lips, is extremely
common, and between the years 1928 and 1942 at the London Mission

Table I -- SITE INCIDENCE OF EPITHELIOMA OF MOUTH

Cheek and lips	2583 (52 per cent)
Lower jaw	1888 (28 per cent)
Upper jaw	349 ( 7 per cent)
Tongue	638 (13 per cent)
Total cases	4853
Separate operations on glands	2590
Plastic operations, tube-flaps, etc	996
Total operations for carcinoma of mouth 1923–42	8489

Hospital at Travancore, 8489 operations were performed on 14,853 patients for malignant disease involving these sites. The relative incidence of the lesions is shown in  $Table\ I$ . Somervell believes that this high incidence of buccal cancer is due to the use of certain kinds of tobacco, and suggests that if an embargo or a high duty were placed on these, 70 per cent of cancer in that part of the country could be abolished. The object of this paper, however, is to review treatment rather than aetiology. Many patients require

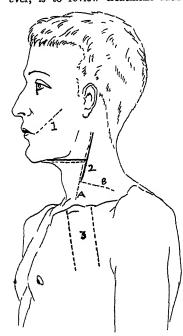


Fig 38—Incisions for (1) Upper jaw, alveolar part (2) Glands of neck, upper glands only, A and B being extensions (3) Tube flap (By kind permission of 'The British Journal of Surgery')

treatment by operation, others are best dealt with by electro-coagulation with diathermy, still others require radium. and a few deep X-ray therapy, while for many combinations of these forms of treatment are indicated If the neoplasm and the lymphatic glands into which it drains cannot be removed at the one stage, the author of this paper believes that it is a sound general principle to operate on the glands, only after the growth has been either removed or rendered innocuous by radium. He advises leaving the internal jugular vein intact if possible, especially if very large, and prefers to peel glands off it and leave radium needles (usually about 14 mg for 8 days) in contact with it than to risk cerebral congestion from its resec-Carcinoma of the tonsil is the most fatal of all buccal cancers owing to its early involvement of the deepest cervical glands Carcinoma of the epiglottis is another very fatal variety

Many of Somervell's cases have been very advanced, and no doubt would have been regarded as moperable by some surgeons, but as he remarks, death from cancer of the mouth is so horrible that many of his patients have asked for operation even if fatal Thus invited, he has obeyed the dictates of humanity rather than statistics, but even so is to

be congratulated on the results of a remarkable series of cases. He appeals for operation to be the recognized treatment for all cases of carcinoma of the upper and lower jaws, and believes radium to be the best treatment for cancer of the tongue or cheek in conjunction with diathermy in some cases. He advises radical measures "One cancer cell left behind will kill the patient, a small radium burn or a little extra mutilation may mean inconvenience, but may mean a life saved". For details of the author's methods of treatment this authoritative paper, based on such wide experience, should be consulted (Fig. 38)

REFERENCE -1Brit J Surg 1944, 32, 85

MYASTHENIA GRAVIS: THYMECTOMY. A Tudor Edwards, M Ch, F R C.S It is believed that there is more than a casual association between myasthenia gravis and thymic tumours, since being tumours are rare lesions, and yet

thymomas have been found in almost one-half of the reported operations or autopsies on patients with myasthenia gravis. The difficulty in assessment of the results of the operation is increased by the fact that spontaneous remissions often occur in this disease

A Blalock¹ records his experience in 20 patients with myasthenia gravis submitted to total thymectomy. He was encouraged by the result which followed the removal of a benigh thymic tumour from a patient with myasthenia gravis in 1936. The early improvement in the first 6 patients indicated further trials. Patients getting along moderately well on prostigmine, and in whom the disease was not very severe, have not been operated upon, whereas no attempt has been made to lower the mortality-rate by refusing to operate upon semiously ill patients in whom there seemed to be little likelihood of a spontaneous remission. The quantity of prostigmine both by mouth and by subcutaneous injection which produced the maximum improvement in each patient was determined pre-operatively for its value in treating the patient both during and after operation

The ages of the patient ranged from fourteen to forty-eight years, 16 being females and 4 males. The duration of illness varied from seven months to twelve years, and 4 patients had had partial remissions. The pre-operative prostigmine requirements were 75–910 mg daily. Only 2 patients had a thymic tumour, the great majority having a persistent two-lobed thymus, which microscopically showed lymphoid hyperplasia with germinal centre formation.

Each patient's history is described and they are classified under five groups. Group 1—4 deaths, 3 post-operative and due to operation and disease, and 1 eight months later—Group 2—3 patients, none affected for better or worse by operation—Group 3—5 patients, moderate improvement, although it is not easy to estimate the importance of the operation in the improvement—Group 4—considerable improvement, 5 patients, of whom only one had had a previous remission several years preceding operation, 4 patients showed early post-operative improvement, and 2 did not require prostigmine at the time of discharge from hospital—Group 5—3 patients, essentially well, all of whom had severe myasthenia gravis, none had had previous remissions, and all exhibited dramatic improvement beginning a few days after operation—The two thymomas occurred in the last two groups, one in each

Blalock states that unfortunately there is no known method by which one may predict with certainty in a given patient the degree of improvement which may be anticipated from operation, although the follow-up suggests that the best results are to be expected in patients who have not had the disease for a prolonged period of time. Thus, the four patients who no longer require prostigmine had had myasthenia gravis for not longer than one year

O T. Claggett and G T Root<sup>2</sup> discuss the surgical approaches for the removal of the thymus and its tumours. They term these the anterior transcostal, the sternum-splitting, and the postero-lateral respectively. In the two former the pleura is not opened.

1 The transcostal approach is not entirely satisfactory and should only be employed when the tumour is known to be relatively small. It is made by incision over the front of the chest on the right side and with the removal of two to three inches of the 3rd and 4th costal cartilages, ligature of the intercostal and internal mammary vessels, blunt dissection outwards of the pleura, and the freeing of the thymus from the loose areolar tissue surrounding it Closure is done in layers

2 The sternum-splitting approach permits of the most direct access to the thymus, and is the one most generally used. It is made by an incision in the midline beginning an inch above the manubrium and extending down to the 4th

costal cartilage The sternum is split by a Lebsche chisel down the middle, and at the lower end transverse incisions are made and the sternal margins retracted. This allows immediate exposure of the thymus, which is then removed by blunt and sharp dissection. In closure, the two halves of the sternum are approximated with steel wire sutures, and the skin and fascia are likewise sutured in layers.

- 3. The postero-lateral approach is usually done from the right side, the incision being made between the vertebral border of the scapula and the spine; the fifth rib is localized, the periosteum detached, and a long segment of the rib resected. The lung is packed down with a moist gauze pack, and the mediastinal pleura is incised over the tumour, which is removed as in the other approaches. A rubber catheter is inserted through a stab wound made in a lower intercostal space, and the wound again closed in layers.
- P B Hardymon and H H Bradshaws record 3 cases of myasthenia gravis treated by anterior mediastinotomy They use as a diagnostic measure, in addition to simple X rays, the introduction of air into the anterior mediastinum. In the first patient there was no definite thymic tissue removed and no objective improvement in the state of the patient after operation. In the second patient, who had been treated by X-ray therapy previous to operation, a tumour was found lying under the 5th/6th costochondral junctions. The result in this patient was difficult to evaluate because of the development of an acute duodenal ulcer complicated by severe and repeated hæmorrhages. In spite of this he continues to have a good range of activity on less than half his pre-operative The tumour present in this case was situated requirement of prostigmine entirely separate from the thymus, lying 5-6 cm below the lowest portion of it, and it was well encapsulated, measuring 9 5 × 8 × 4 cm Microscopically the tumour consisted of large irregular areas of cell proliferation of the reticulum-This constituted an apparently benign tumour In the third patient, the thymus was removed and no tumour was found. Microscopically it revealed normal thymic tissue consisting of thymocytes, reticular cells, and a large number of Hassall's corpuscles

These authors agree with previous writers on the subject that the relationship of the thymus to myasthenia gravis will be more clearly determined after careful correlation of the clinical findings, pathological changes in the gland, and the post-operative results in a larger group over a period of several years References—'J Thorac Surg 1944, 13, 316, 'Surg Gynec Obstet 1944, 78, 397, 'Ibid 402

### NASAL SINUSITIS.

F W Watkyn-Thomas, FRCS

Sulphonamide Treatment.—In an analytical review of "The local use of sulphonamides in nasal and sinus infection", N D. Fabricant¹ remarks that "In attempting to establish the usefulness of local applications of sulphonamides to infections of the nose and sinuses, the preponderant majority of writers appear to neglect the entire body of knowledge known as Nasal Physiology"

Chronic sinusitis, as Fabricant rightly emphasizes, is not a specific disease. No single medicament can master the complex of infection, degenerative change, and constitutional factors Furthermore, any medication must be compatible with ciliary action and the physiological nasal  $p{\rm H}$ , non-toxic, and non-traumatizing to the mucosa, otherwise it will be not only useless but actively harmful

The normal human nasal pH ranges about 5 5-6 5 In acute rhinitis and the more active stages of allergic rhinitis there is an abnormal alkaline pH. The rational treatment would be a medicament which would lower the alkaline pH to the normal slightly acid level The sodium salts of the sulpha group are extremely alkaline, and therefore have a definitely caustic reaction. In

a series of animal experiments there was post-mortem damage to the entire nasal mucosa, especially in the olfactory area, and this damage was most marked where sodium sulphathiazole and butanoyl-sulphanilamide were used; sodium sulphadiazine was not so completely destructive, but was definitely injurious

Cocaine solution with the sulphathiazole produces an acid pH, as well as anæsthesia, and counteracts the nasal distress, but even so in a series of clinical cases, some patients did not tolerate the application, and developed reactions resembling an allergic rhimits. None of the combinations of sulphathiazole with constrictors is free from this risk, and it is not possible to detect the sensitivity in advance. Attempts are being made to find a non-irritating, stable combination of the sulphonamides which will be free from these risks

The clinical reports are highly contradictory. A factor of error is that free discharge of mucus after local sulphonamide treatment may be a reaction to the irritation of the alkaline agent, not a flow of discharge from the sinuses

It is agreed that local use of the sulphonamides in septic wounds is valuable, it is held by some to be unjustifiable and unnecessary in a clean wound. Some writers have found the medication disappointing in acute rhintis, but helpful as a packing in opened sinuses; others report necrosis of the antral lining following such treatment, and severe discomfort, lasting sometimes twenty-four hours, after sinus replacement with sulphonamide solutions, others cannot satisfy themselves that there is any improvement by local use

There is disagreement, too, amongst those who advocate the local medication as to the proper method of using sulphonamides — Most favour sprays or instillation of solutions or suspensions, others advocate application of the powder or of a relly

Recently the microcrystalline form of the drugs has been used in suspension, and good results have been claimed, but toxic reactions have been described in two cases. A 'smoke' of a suspension of microcrystals has been used. Experiments show that satisfactory blood-levels of sulphonamide can be so produced (three deep breaths give a level of 3-5 mg per 100 c.c. of blood in less than 15 minutes). The method does not seem free from danger, as mice so treated died in a few hours and the lungs showed gross hyperæmia

Fabricant mentions the danger of sensitization by local application of sulphonamides to internal administration, and quotes a fatal case. In this connexion, B Shaffer, J W Lentz, and J A McGuire² describe 4 cases in which local treatment of skin conditions by sulphathiazole induced sensitivity which was elicited by later oral medication, and I M Schnee² describes a case of membranous inflammation of the nose, oropharyinx, and conjunctive due to sulphathiazole administration by mouth. Although this case is not comparable with the others just described, it does suggest the possibility of a specific mucosal-susceptibility in some individuals which would greatly increase the risks of any local medication.

Fabricant raises another, and little regarded, problem The nasal constrictors are most valuable to us, but a powerful constrictor may cause anoximms of the mucosa, sometimes complete although transitory. Any damage done to the cells is probably reparable, when the constrictor action passes off, but in the presence of sulphonamides the damage might be increased.

Fabricant concludes: "With respect to the role of sulphonamides in nasal and sinus infection, the clinician should not on the basis of inconclusive clinical evidence run too far ahead of competent and painstaking laboratory evidence. While the evidence to date would seem to indicate caution in the use of some of the sulphonamide preparations in the nose and sinuses, others are employed successfully in a limited number of directions. These do have an important place in contemporary rhinology. Indeed, it is quite possible that the near

future may see the further introduction of sulphonamide preparations which locally are non-toxic and which are compatible with the tenor of modern-day nasal physiology Such agents, however, may in time prove useful only as an important adjunct to the effective treatment of nasal and sinus infection, rather than as a universal 'cure-all'"

Operation Technique.—Norman Patterson<sup>4</sup> describes a radical external operation for chronic sinusitis with polypi (*Plates XXIII–XXV*). The operation was first described five years ago <sup>5</sup> In this interval of time sufficient of these operations have been done to show that freedom from recurrence can generally be guaranteed

The skin incision is made below and external to the inner canthus, and follows the nasojugal fold. The periosteum is raised as far as the attachment of the inner tarsal ligament and out nearly to the infra-orbital foramen. The lacrimal duct is exposed by removing a little of the antral roof, freed, and mobilized. The periosteum is stripped from the inner orbital wall nearly to the orbital apex, and the whole of the ethmoid is removed. The nasal mucosa is then opened internal to the lacrimal duct. Patterson has found that the duct is almost surrounded, in most cases, by diseased ethmoid cells. The antrum is opened from above, and if need be the antronasal wall above the inferior turbinal can be removed to establish permanent drainage. The sphenoid can be inspected and opened if infected. It may be difficult to deal with fronto-orbital cells through this incision. In some cases the lower region of the frontal sinus can be explored through the ethmoid incision.

S W G Hargrove<sup>6</sup> summarizes the results of 28 consecutive cases of chronic sinusitis with polypi treated by this method in the period 1939-1948 In 12 cases both sides were operated on, with a three-month interval between the two sides There were no post-operative complications except slight epiphora in the first 11 cases. In the last 17 cases where the lacrimal duct was carefully preserved, epiphora was negligible, and when it did occur quickly passed off In nearly all cases where there was defect of taste or smell normal sensation returned after operation. In 1 case persisting headache made a radical frontal operation necessary later. In no case does there seem to have been any recurrence of the polypi. The scar is hardly visible [This should be a most useful addition to our methods of approach to the ethmoid The usual fronto-ethmoid operations do not give easy access to the antero-inferior cells, and the Jansen-Horgan operation, admirable in suitable cases, does not allow approach to the anterior regions adequately Control of hæmorrhage should be as easy as in the Ferris-Smith operation, and detachment of the pulley of the superior oblique should be easily avoided by Patterson's route -F. W. W-T]

REFERENCES — Amer J med Sci. 1943, 206, 546, \*J Amer med Ass 1943, 123, 17, \*Brit. med J 1943, 1, 506, \*Lancet, 1944, 1, 558, \*J Laryng 1939, 54, 235, \*Lancet, 1944, 1, 560

## NEONATAL MORBIDITY AND MORTALITY.

Regunald Miller, M.D., FRCP.

This subject has attracted considerable attention in the last few years. L G Parsons, for instance, devoted the first Charles West lecture to the "prevention of neonatal disease and death", and other lectures have been given by C. McNeil and J L Henderson. The reasons for this interest are not far to seek. In the first place, the number of deaths occurring in the first month of life is still very high, and feetal and neonatal mortality together account for the loss of something like 48,000 lives a year in England and Wales. Secondly, although there is diminution in the number of neonatal deaths this improvement has not kept pace with the decrease in the infant mortality as a

## PLATE XXIII

## OPERATION FOR CHRONIC SINUSITIS WITH POLYPI

(VORWAN PATTERSON)

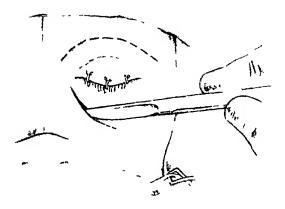


Fig. A —Eyelids sutured Incision being made

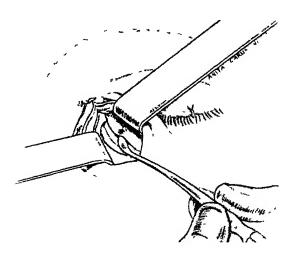


Fig. B —Separation of periosteum from superior maxilla

Plates XXIII-XXV by kind permission of 'The Lancet'

# PLATE XXIV

# OPERATION FOR CHRONIC SINUSITIS WITH POLYPI —continued

(NORMAN PATTERSON)

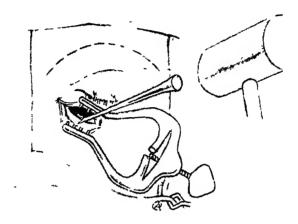


Fig. C.—Chiselling into lower orbital margin in order to expose the antrum

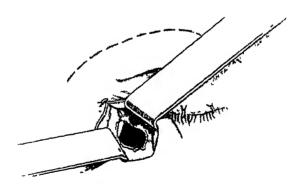


Fig. D —Antrum opened and masolacrimal duct being exposed

# PLATE XXV

# OPERATION FOR CHRONIC SINUSITIS WITH POLYPI —continued

(NORMAN PATTERSON)

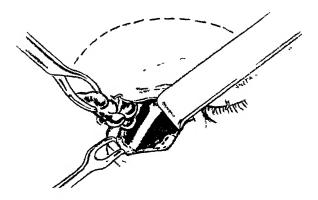


Fig E-Removal of polypi from the ethmoid under illumination from coldlite retractor

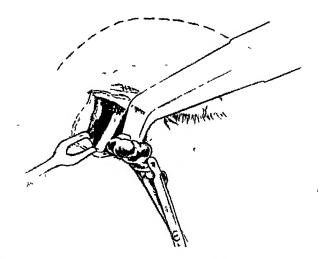


Fig. F.—After removal of the lacrimal portion of the frontal process of the superior maxilla and the ethmoid bone, the nasolacrimal duct is mobilized



whole Lastly, infective processes which are so frequent a cause of neonatal death after the first week of life appear to be even more prevalent in hospitals and institutions than in private houses. In view of the fact that more and more women seek institutions for their confinements (and this tendency will probably be maintained or increased) this is particularly regrettable

Terminology.—Considering the respectable antiquity of the subject, it is curious that such ambiguity still exists in the use of some terms as to lead to confusion. The term "stillbirth", for instance, in this country generally despotes that the fectus shows no signs of life after birth, no beating of the heart, stid no respiratory or other movements. Where heart-beats can be noted the birth is classed as a "live-birth" even though the child dies before attempting to breathe. Some authors, however, name these two groups of cases as "dead-birth" and "stillbirth", though Somerset House does not recognize any difference between them. According to this nomenclature it will be seen that what is termed a "stillbirth" by some authors is classed as a "live-birth" by others. Further, on the Continent a child is classed as a "dead-birth" unless it breathes, even though its heart may be beating

The term "prematurity" was also used ambiguously Some few years ago, however, an international medical committee of the League of Nations defined it as a birth-weight of 5½ lb (2500 g) or less, irrespective of the length of gestation. This definition has been widely adopted and has been accepted by the Royal College of Physicians, in spite of the fact that it makes it practically synonymous with the term "immaturity". The standard of weight used, however, is of value, for it is at and below the weight of 5½ lb that the risks of delivery and the neonatal period become enhanced (McNeil)

These confusions must be kept in mind in reading statistical or other studies of neonatal problems. Authors at present would do well to define their terms

Age-modence of Neonatal Deaths.—On this point Parsons writes "Nearly three-quarters of the total neonatal deaths take place in the first week, and about half of these on the first day, indeed, the slight improvement in neonatal mortality in the last 30 to 40 years is due almost entirely to a reduction in the deaths in the last 3 weeks of the neonatal period." Henderson makes the same point. In his study of 369 neonatal deaths there were 263 in the first week of life, of which 218 occurred in the first 3 days and only 45 in the remaining days of the first week

Causes of Neonatal Death.—These are classed under six headings (1) asphyxia, (2) infection, (3) intracranial hamorrhage, (4) developmental malformations, (5) prematurity, and (6) miscellaneous The frequency of these different causes varies greatly according to the age of the neonate, particularly, the most controllable cause, that of infection, operates almost entirely after the first week of life Henderson's figures show that deaths during the first 3 days of life are, in order of frequency, due to asphyxia, intracranial hamorrhage, prematurity, and developmental malformations while in the remaining weeks infection plays the chief part (30 out of 55 deaths in the second week, 32 out of 39 in the third week, and 9 out of 10 in the fourth week in Henderson's series)

Neonatal Infection.—In all three lectures under review much emphasis is laid on this subject as being the one in which there is the greatest possibility of control by the pædiatrician. Of such infective processes the two of chief importance, because of their frequency and danger to life, are gastro-enteritis and respiratory tract infections, including primary pneumonia

Gastro-enteritis is the bugbear of maternity departments. Its bacteriological cause is unknown, but it certainly can occur in epidemics (epidemic diarrheea of the newborn) It consists chiefly of diarrheea with occasional vomiting, and dehydration and loss of weight are rapid. It formerly carried a death-rate

of 70 to 85 per cent (Henderson), but since the introduction of treatment by sulphaguandane there has been a welcome fall in fatalities. Henderson's own results of this line of treatment show a death-rate reduced to 10 per cent. He lays stress on three points. (1) The importance of giving large doses of the drug—½ g four-hourly for mature and ½ g three-hourly for premature infants, (2) The importance of withholding milk completely until the appetite returns, and (3) The necessity of giving a high fluid intake, by gavage if necessary. He uses 5 per cent lactose in water as the substitute for milk

Staphylococcal infections have recently attracted attention. In about half of such cases the original lesion is conjunctivitis. Others start in various skin lesions, and staphylococcal pneumoma is a recognized condition in the newborn. In an epidemic of bullous impetigo and other staphylococcal skin lesions. T. H. C. Bemans<sup>4</sup> found that 85 per cent of the nurses had become nasal carriers and that 100 per cent of infants 10 days old were the same. The anterior inch of the nares was the common site of the infection and evidence of throat infection in carriers was comparatively uncommon. Infection appeared to be spread by contamination of fingers from used handkerchiefs rather than by droplet infection.

Preventive Treatment.—The sociologist is concerned with such housing, feeding, and working conditions for expectant mothers as may be expected to help in the production of healthy and mature infants The obstetrician is responsible for the successful management of births Thereafter, the pædiatrician is concerned with many problems, of which the prevention of infection and cross-infection is the most discussed at the present time. As already pointed out, these dangers are particularly prone to be present in maternity hospitals and institutions, as compared with private houses. It is then from the reorganization of arrangements in such institutions that progress may be The measures that appear to be necessary consist of the isolation of mother and child in glass-walled cubicles, and various obvious antiseptic precautions in nursing both mother and infant. It is clear that more nurses will be necessary to work such schemes, and all of them involve increased expense in hospital construction and working. There is, however, already evidence that their adoption is capable of successfully reducing neonatal mortality

REFERENCES — Lancet, 1944, 1, 267, \*Edinb med J 1943, 50, 491, \*Loc cit 535, \*Brit med J 1943, 1, 623

NEUROSES AND PSYCHOPATHOLOGY. Aubrey Lewis, MD, FRCP.
The frequency with which tension is used in medical literature as a synonym

The frequency with which tension is used in medical literature as a synonym for anarety points to the importance of motor behaviour in this psychological state. D E Cameron¹ made an inquiry into the "skeletal muscle pattern" of 47 patients in whom anxiety was prominent. He satisfied himself that the patients which had been dominant in the patients before their anxiety took a morbid form would remain prominent during any illness in which anxiety was intense. Cameron thought that this should be taken into account in selecting industrial personnel. He also observed that when morbid anxiety became very intense other patterns of muscular behaviour would be affected besides the dominant skeletal one, thus cardiovascular and gastro-intestinal symptoms would become evident. The patient may put all the emphasis on a particular aspect of the pattern, so that he complains only of aching in his neck or stiffness in his face.

Albuminuma in healthy young persons has been attributed to many causes, but it is not generally assumed that emotion is responsible J H Ahronheim<sup>2</sup> noticed that air cadets who fainted after venepuncture almost always had

considerable amounts of protein in the urine afterwards, though their urine before the puncture had been free from albumin. He therefore made a systematic investigation of the urine before and after venepuncture in 1000 young men free from physical disease and with ages ranging between 17 and 26. In more than half of the men albumin was found in the second or in both specimens. These findings are of interest in view of earlier estimates as to the frequency of beingn albuminuma. Thus H. S. Diehl and C. A. McKinley's had found the condition in 5.3 per cent of 20,000 male students and H. H. Bashford's estimated a similar percentage for English adolescents. Ahronheim quotes other evidence in support of his opinion that the emotional factor is more important than posture or other supposed causes for this condition, he cites, for instance, a young pilot who noticed that his motor was failing on a training flight and who escaped death by the skin of his teeth; soon after there was a heavy deposit of albumin in his urine though at other times it was free of protein.

The forms of mental abnormality that may follow epidemic encephalitis have not usually been thought to include severe paranoid disorders. A rare case of this is described by W. H. Gillespie. The patient had oculogyric crises during which his feelings of hostility became much more acute. Gillespie discusses the psychopathology of the condition, paying particular attention to the role of the eye symptoms.

A Lewis and K Goodyears report the results of a scheme whereby hospital psychiatrists recommended special postings for neurotic soldiers who would otherwise have had to be discharged from the Army Courses arranged at a Technical College permitted the occupational suitability of these patients to be assessed The success of the recommendations is related to the intelligence and other characteristics of the soldiers in question.

In order to throw light on which patients with dyspepsia should be referred for a psychiatric opinion, H Montgomery, R Schindler, L. O Underdahl, H. R Butt, and W Walters' examined with great thoroughness 45 consecutive naval patients with symptoms referable to the upper part of the gastro-intestinal tract, 23 of them had a duodenal ulcer, confirmed by X rays, among these psychoneurosis was not found to be common, only 2 had moderate, and 4 mild, neurotic symptoms Of the remaining 22, 17 had some degree of psychoneurosis. The authors conclude that as a rule persons with a duodenal ulcer require psychiatric examination only when there is some special indication, whereas if there is no ulcer a thorough psychiatric interview is necessary for all persons complaining of dyspepsia

W C Alvarez,<sup>8</sup> following a somewhat different line of thought, explains that since mental stress can cause a healed ulcer to flare up and can aggravate an existing ulcer, he advises his patients when their duodenal ulcer has become apparently quiescent to keep on the alert for psychic strains. If on a given day they have to weather some emotional crisis they are to begin with a constant alkaline drip or take food and alkalis every one or two hours during the first part of the ensuing night, to counteract the emotionally produced hyperacidity.

S. M Small and A. T. Milhorat's made careful metabolic observations on 4 girls with anorema nervosa. No confirmation was found for the view that there is a primary metabolic disorder in such patients. They could lose weight, even with a diet which would have been adequate for the average person, because their anxiety made them very active Unless the intake of food and the collection of arme and fæces had been carefully supervised it would have been possible to be misled as to the cause of the patient's manition. The results of treatment aiming at the alleviation of anxiety were fairly satisfactory.

R. E. Hemphili<sup>10</sup> reports a man of 33, diagnosed as having obsessional neurosis, who took too little food and became very emaciated. After he had been in a state of maintion for some years, without the restless activity commonly seen in anorexia nervosa, he was admitted to a mental hospital. His weight was three stone less than it had normally been. There was evidence of hypogonadism. Biopsy of the testis showed atroplue changes. Eighteen months after admission to the mental hospital and further loss of weight, a frontal leucotomy was performed upon him. The day after operation he began to eat, and ate ravenously from them on. Sexual activity was restored, and he was ablet to leave hospital. Shortly afterwards he became engaged to be married. The output of 17-ketosteroids, which had been 3 28 mg per 24 hours before operation, rose afterwards to 8 87 mg.

PRIMERENCES — Amer J Psychiat 1944, 101, 36, \*War Med 1944, 5, 267, \*Arch intern Med 1942, 49, 45, \*Practitioner, 1935, 135, 272, \*J ment Sci 1944, 90, 582, \*Lancet, 1944, 2, 105, \*J Amer med Ass 1944, 125, 890, \*Ibid 903, \*Amer J Psychiat 1944, 100, 681, \*Lancet, 1944, 2, 345

NUTRITIONAL IRON-DEFICIENCY IN WAR-TIME (See ANÆMIA, HYPO-CHROMIC)

OBESITY.

Sir Walter Langdon-Brown, M.D., D.Sc, F.R C P. Samuel Leonard Simpson, M.A., M D, F.R C P

The Management of Obesity, with Emphasis on Appetite Control.-N H Colton, H. I. Segal, A Steinberg, F R Shechter, and N Pastor<sup>1</sup> treated cases along conventional lines of low calone diets, thyroid, and mercurial diuratics, the latter preceded by ammonium chloride, but, in addition, they recorded appreciable aid from an appetite-depressing substance, amphetamine sulphate (benzedrine) Previous workers had claimed similar results with digitalis, belladonna, propadrine hydrochloride, and benzedrine The objection to the last is that it produces nervousness, irritability, and insomnia, but the authors found that the effect was mainly in the lævo-rotatory isomer, whereas dextro-amphetamine was relatively innocuous but contained the appetited depressing factor Thus, 15 mg daily were tolerated easily by most patients 5 mg. being given on rising, 5 mg at 11 am, and 5mg at 4 pm . These are much larger doses than would be possible with ordinary benzedrine or lævo-rotatory form In addition, 1 to 2 cc. of salyrgan-theophylline, given intravenously, weekly, with good result [The intravenous route for mercurial diuretics has proved fatal in patients with cardiac and renal disease, and the therefore generally discarded, but we are not aware of recorded fatalities from its use intravenously in uncomplicated obesity. The intramuscular route is edite effective, but is sometimes painful.] When mercurial diuretics become differentiate, the authors found that the addition of 10 c.c. of 20 per cent sodium decholm produced a marked diuresis [This procedure, too, is not without risk, as one fatal case has been recorded elsewhere.] The patients were mostly fat women, and the loss of weight was in the order of 80 lb, in nine months

REFERENCE.—1Amer J med Sci 1948, 206, 75

Cancer.—P. H. Hohnger and H J. Hara¹ describe a study of 100 consecutive cases of cancer of the esophagus There were 91 males and 9 females. The average age was 605 years, with a range of 38–83 years. In 6 of the 9 works the growth was in the post-crice that, 1 in the middle third, 1 in the lower third, and 1 at the cardia. In the middle third, 14 in the lower third, 39 in the middle third, 14 in the lower third, and 13 at the cardia

History of previous illnesses was too variable to allow any deduction, but excess in eating and drinking and dental sepsis were frequent. Excess in tobacco and alcohol-is suspected as a factor, but in this series no relationship could be proved. In 2 women pre-existing scars were found, and were probably the cause. Only 2 patients were negroes.

Insidious onset without pain is the usual course. In 45 cases there was epigastric discomfort at some time; in all but two of these the growth was in the lower two-thirds, and in 12 cases epigastric distress was the first symptom. Substernal pain was the initial complaint in 6 cases, and appeared later in 28 others, sometimes this was relieved by voluntary regurgitation. Hoarseness was an initial symptom in 5 cases, and appeared later in 20 more. Cough, worse at night, was mentioned in 22 cases. The most frequent single complaint was dysphagia, in 51 cases this was the initial symptom. Regurgitation was noticed in 46 patients. Dysphæa, hæmatemesis, aural pain, and sore throat were found occasionally

Radiographs are not infallible, especially for the introitus, where the tumour may be obscured by bony structures and laryngeal cartilages which are often ossified In this region, too, the barium passes so quickly that small irregularities are difficult to outline

Esophagoscopy and biopsy give accurate diagnosis, but repeated biopsy may be needed. There were 9 cases of adenocarcinoma, all in the lower cesophagus. Of these, 8 were extensions of a primary gastric carcinoma. There were 88 epitheliomata, 1 basal-cell carcinoma, 1 transitional, and 1 colloidal work of the epitheliomata were highly malignant, classified Grades 2 and 3 on Broder's classification.

The interval between onset and the time of biopsy was from two weeks to ten years — In 62 per cent the interval was under six months

The writers point out that carcinoma of the esophagus is a local condition until the later stages, and that only 40 per cent of their cases showed metastases. Therefore, so long as the disease is limited to the lumen, surgery should give the best chance of a cure

**Esophageal Lesions in Generalized Progressive Scleroderma.**—J R Lindsay, F E Templeton, and S Rothman² describe 5 consecutive cases in which disturbance of cesophageal function was a characteristic of generalized scleroderma. The findings were —

- 1 Loss of peristalsis in the lower two-thirds, with accompanying mild dilatation and relaxation down to the phrenic ampulla, and probably some atomy of the cardiac sphincter This is a direct result of the sclerodermatic process.
- 2 Difficulty in swallowing solids or fluids, especially in the lying-down position, due to delayed emptying of the esophagus.
- 3 Burning pain behind the sternum about an hour after meals, worse on lying down and worse on the left side, due probably to regurgitation of gastric contents into the esophagus and resulting chronic esophagits
- 4. Chronic ulceration of the lower third of the esophagus, chiefly just above the phrenic ampulla This is probably a direct result of the esophagus, with the sclerosing change as a predisposing cause
- , 5 In the later stages stricture formation in the same region

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REFERENCES — Laryngoscope, Lond. 1942, 52, 968, 'J Amer med. Ass 1948, 123, 745

, OLD AGE, MENTAL DISORDERS IN. (See MENTAL DISORDERS IN OLD AGE.)

ONYALAI. Sir Philip Manson-Bahr, C.M.G, DSO, M.D, FRC.P. H. B Stein and E Miller have brought forward further proof, if such be needed, to show that the tropical disease onyalai—a disease characterized by blood blasters on the mouth and other manifestations of purpura—is not a localized indigenous disease, but is, as originally suggested by Blackie, a form of essential thrombocytopenic purpura, whilst, further, it is not necessarily, as had been previously surmised, confined to native races

The response to therapy in onyalar resembles that in patients with purpura

So much importance has been paid to the blood blisters that it was not till 1938 that Gear drew attention to purpure manifestations as characteristic of the disease. This failure to recognize cutaneous purpura is obviously to be ascribed to the difficulty of detection on black skins. In acute thrombocytopenic purpura (Werlhof's disease—purpura hæmorrhagica), as seen in Europeans, blood blisters have not been recorded, at least in medical textbooks.

Diagnostic essentials for the diagnosis of thrombocytopenic purpura are:
(1) Spontaneous purpura and free bleeding from the mucous membrane,
(2) The blood-platelets must be substantially decreased—less than 100,000 per c mm of blood, (3) Clotting and prothrombin time must be within normal limits; (4) Anæmia and leucocyte count must not be out of proportion to the amount of bleeding, (5) There must be no pathological cells either in the

blood or bone-marrow, (6) There must be no appreciable splenomegaly or lymphadenius

In women, fever, blood blisters, and menorrhagia characterize onvalai

Of 21 cases investigated, 3 were associated with specific diseases, the other 18 were idiopathic. Of the latter, 6 were classified as mild, 6 as moderately severe, 3 as acute with hæmorrhages into vital organs. Three were of a type aggravated by menstruation. The youngest patient was a native female aged seven months.

The following conclusions were arrived at :-

- 1. Onyalai is an idiopathic form of acute thrombocytopenic purpura, but is associated with hæmorrhagic bulke, and affects chiefly young adult men and appears to be confined to South Africa
- 2. It is not, as had previously been thought, restricted to indigenous native races
- 8 The course of the disease, its aggravation by menstruation, and response to treatment, are similar to acute incipient episodes of idiopathic thrombocytopenic purpura.
- 4. Intramuscular blood injections are not 'specific' for onyalai. Blood transfusions are much superior to intramuscular blood
- 4.5. In future, it is suggested that splenectomy should be tried in cases where remission fails to set in within a week after blood transfusion therapy

REFERENCE.—'S Afr J. med Sc 1948, 8, 1

GONORRHGA.) (See also Conjunctiva, Diseases of;

T Anwyl-Davies, M.D., F R.C.P.

Legislation in Massachusetts requires the physician to treat the eyes of an infant within 2 hours after birth with a prophylactic approved by the State Department of Public Health. H B. C Riemer<sup>1</sup> has pointed out that not a single case of blindness due to ophthalmia neonatorum had been reported during the past year—an excellent example of satisfactory prophylaxis following adequate legislation. In a recent study of 1176 cases of blindness, infectious disease was considered to be the cause in 32 per cent, syphilis in 11 per cent, and ophthalmia neonatorum in 5 per cent.

### ORIENTAL SORE (CUTANEOUS LEISHMANIASIS).

Sir Philip Manson-Bahr, CMG, D.SO, MD., FRCP.

As Russian concepts of cutaneous leishmaniasis differ considerably from the views held elsewhere it is useful to give a summary of recent work on the subject

A paper by P V Kojevnikov<sup>1</sup> (1942) contains a succinct and popular exposition of this disease in all its aspects. The investigations which led up to the conception that it is a zoonosis were carried out by N. I Latyshev and A P Kriukova<sup>2</sup> (1941) They have established that in Middle Asia endemic foci of the moist type are to be found in rural settlements adjoining the desert spaces Here the sandflies, which convey the parasite to man, breed almost exclusively in the burrows of wild rodents (gerbilles and marmots) which live in the sand Dissection of large numbers of "wild-caught" sandflies revealed infections with flagellates (Leptomonas) in 3 5 per cent of female phlebotomi-(P. papatasn and P caucasicus) caught in the open, but from 6 to 35 per cent of these insects recovered from rodent burrows Moreover, in the laboratory the gerbilles, especially, proved susceptible to infection with Leishmania tropica.

Amongst rodents in the wild state, examination revealed infections of L tropica in 30 per cent of gerbilles-Rhombomys opimus This is the chief species, but a smaller proportion of others of a different genus-Meriones erythrourus and M meridianus-were found affected Of the sousliks or marmotlike rodents, Spermophilopsis leptodactulus was the chief. In most cases the sores were situated on the ears

In Middle Asia (Russian Turkestan) oriental sore in man is prevalent in small settlements, villages, and towns, but in country districts it spreads mainly along the course of river valleys, the irrigated oases of the Turkoman desert, and especially on the Island of Tchleken in the Caspian Sea. In the Caucasus region, again, cutaneous leishmaniasis is found in the Transcaucasian Republics of Azerbaidjan, Georgia, and Armenia From the clinical aspect Russian physicians have recognized, more especially in Turkestan, two forms of cutaneous leishmaniasis. At first they were inclined to believe that the various clinical manifestations were attributable to differences in the individual reactions of the human host, but this does not appear to be so. It is now established that oriental sore in man is represented by two quite distinct clinical types. The first is the 'dry' type prevalent in towns, in which hard papules persist for months before they break down and ulcerate 
The course of the disease is essentially chronic The second, or 'moist' type, is found in the open country. Here the lesions ulcerate after the 'sore' has been established for a week or longer, and it runs an acute course These two types have been defined by Kojevnikov<sup>3</sup> (1941) as "leishmaniasis tarde exulcerans" and "leishmaniasis cito necrositans", as follows

Definition Synonyms Incubation period Course of disease

Lymphangitis Parasites in lesions Virulence for mice Distribution Seasonal

Dry type Ashkhabad or Kokand sore Long (2-6-12 months) Chronic, unbroken, dry papules persisting several months Ulceration re-Duration up to tarded 12 months or longer Rare (10 per cent) Numerous Low Urban Perennial

Moist type with early ulceration Pendeh or Sart sore Short (1-6 weeks) Acute moist lesions
Ulcerating rapidly (in 510 days) Duration less than 6 months

Common (70 per cent) Scanty High Rural Æstivo-autumnal

REFERENCES — Cutaneous Leishmaniasis (Ashkhabad and Pendeh sores), 1942, Ashkhabad (in Russian), 'Trav. Acad. milit. med. Armée Rouge, U.R.S.S. Moscow, 1941, 25, 229, "Cutaneous Leishmaniasis in Turkmenia and the Fight against it", Problems of Cutaneous Leishmaniasis, 1941, 98, Ashkhabad (in Russian, with French summary)

OSTEO-ARTHRITIS. (See also Chronic 'Rheumatic' Disorders)

# OSTEO-ARTHRITIS OF HIP-JOINT: ARTHROPLASTY IN.

T P. McMurray, FRCS

The provision of voluntary painless movement with stability in a hip-joint ankylosed by arthritis is generally recognized as one of the most difficult problems in the field of surgery, in fact, by many surgeons it has hitherto been regarded as an impossibility When a hip-joint is affected by osteo-arthritis and there remains only a small range of painful movement the greater and more urgent problem must be the removal of pain, rather than the increase of the mobility of the joint Pain, in such cases, can be removed by the destruction of the articular surfaces and the provision of a bony ankylosis in place of the small range of movement which, because of the accompanying pain, may be extremely disabling. If one hip is affected by osteo-arthritis, and if at the same time the other hip and the lumbar spine are free, the loss of movement which follows arthrodesis causes comparatively little disability to the patient, either in walking or on sitting. The problem is altogether different when both hips are affected, and even more so when, in addition, osteo-arthritic changes are present also in the lower region of the spine Under these conditions it is obvious that further restriction of movement must be avoided, and the surgeon's efforts should be directed towards the provision of movement in one or both of the affected hip-joints. It is obvious that the ideal result of surgery is the provision of a strong, mobile, painless joint, and this can only be obtained by some form of arthroplasty

Paul H Harmon1 describes a method of arthroplasty of the hip, using for the intervening material a cup composed of one of the plastic compounds, of which many different types are being used in industry From a consideration of their physical properties the metacrylate resins (lucite and plexiglass) were These substances are polymers of methyl methacrylate, and when cast in rods they are clear, light in weight, slightly flexible, but also durable. The material is not affected by alkalis, oils, dilute acids, solutions of mineral salts, or dilute alcohol, and above all, it is freely pervious to X rays successful application of the cup principle to arthroplasty of the hip came with the utilization in surgery of the newer metal alloys, especially vitallium. Hopkins and Zuck reported the first use of a vitallium cup for hip-joint arthroplasty in a patient suffering from osteo-arthritis of the hip-joint following trauma Since then, Smith Petersen has reported on the use of a flanged vitallium cup which, when used for arthroplasty of the joint, is allowed to remain more or less free, being attached neither to the head of the femur nor to the acetabulum

The author states from his experience that, following an operation for arthroplasty, relief from pain is definitely greater when the plastic cup is used than is obtained following metallic cup arthroplasty. He believes that the cause of this improvement in results rests on the lesser degree of surface hardness in the-plastic material as compared with metal

The technique of the operation follows closely on that described by Smith Petersen, through the anterior approach with a small posterior curve along the crest of the ilium, the sartorius is detached with a small flake of bone and turned downward. A portion of the origin of the tensor fascize femoris, and the extreme lowermost fibres of origin of the gluteus minimus, are detached by subperiosteal dissection from the lower anterior iliac crest. The origin of the tendinous head of the rectus femoris is defined at the anterior inferior iliac spine, and temporarily flivided close to the bone. The head of the femur is now rotated or levered out of the acetabulum and modelled to approximately

the same diameter as the neck of the femur Peri-articular osteophytes are removed by a curved chisel, and in this removal it is usually impossible to avoid cutting portions of the iliofemoral and pubocapsular ligaments in which many of the growths originate. The plastic cup is now fitted snugly over the modelled head of the femur, the cap should fit closely, but should not require force for its application. Following the application of the cap, the head of the femur is restored to its normal position in the acetabulum by internal rotation of the thigh. No special attempt is made to re-attach the ligaments, although sutures should be inserted to approximate as far as possible the cut edges. Following the operation, the hip is retained in a position of internal rotation for 2 or 3 months, this can usually be managed by the application of a broad band of adhesive strapping, applied so as to turn the limb inwards. At the same time, for extension weights of 7 lb are used, either alone or in conjunction with a Hodgen or Thomas splint used as a cradle

Following this period, active and passive exercises are given daily, both for the hip and the knee, while the patient is instructed to carry out active abduction of the hip with and without flexion for at least 10 minutes during every waking hour. The patient is encouraged to walk with crutches after 28 days, while full weight bearing on the operated leg is permitted in 4-7 weeks

The late results of the operation—which are judged after an interval of at least 18 months—are reported in 16 instances. The results are described as excellent in 10 cases, good in 3, and poor in 3, and the author stresses the fact that the relief from pain, which was the primary object of the operation, was complete in at least half the number in whom the method was employed. Although such results must be regarded as extremely favourable, considerable further experience is needed before a definite decision can be arrived at in regard to the virtues and dangers of the various types of foreign material which are now commonly used in this operative procedure, and further observation over at least 2 or 3 years is necessary before a final decision can be given as to the amount of permanent improvement which has resulted from any particular operation

REFERENCE — Surg Gynec Obstet 1942, 76, 347

#### OSTEOMYELITIS.

Sir John Fraser, M Ch , F.R C S Ed.

The treatment of hæmatogenous osteomyelitis continues to be the subject of attention, and it is evident from the opinions expressed in recent publications that the conservative attitude is gaining an increasing degree of support. The value of immobilization, of antitoxin therapy, and of general measures, has been appreciated for a considerable length of time, but the possibilities of specific antibacterial methods have become apparent since the introduction of the sulphonamide group of drugs, and more recently by the recognition of the outstanding value of penicilin in certain types of infection

Considerable interest was focussed on the possibilities of conservatism as a result of an article by Hoyt, Davis, and van Buren published in 1941 and reviewed in the Medical Annual, 1943 (p 237) The review was presented at a meeting of the American Medical Association. Those who discussed the paper were encouraging, but guarded in their opinion, and they adopted the very proper attitude that further experience of the method would be necessary before a reliable estimate of its value could be arrived at Such information is now forthcoming, and the evidence offers some support to the optimism displayed by Hoyt and his collaborators. Reference may be made to two reports applicable to the question. C. Dennis¹ records his experience of 5 cases of acute hæmatogenous osteomyelitis occurring in children treated by

immobilization in plaster and coincidentally by the administration of sulphathiazole in amounts sufficient to maintain a blood level of 3 to 5 mg per 100 c.c. In four instances no surgical intervention was required, and a complete cure resulted; the fifth passed into a chronic stage which demanded drainage and sequestrectomy. He discusses the value of a similar procedure in the chronic type of the disease, and in this instance his report is discouraging, it being his experience that immobilization and sulphathiazole therapy are ineffective, and that radical drainage of the bone focus, together with the local implant of sulphathiazole powder, was necessary. It is proper to say that the latter observation in no way contradicts the claim that conservatism and sulphonamide therapy are an appropriate procedure in acute examples of the disease; there will be general agreement that chronicity alters the outlook completely, for it is obvious that time effects changes in the organism, in the antigenic power of the toxin, and in the tissue reactions which are bound to militate against the efficacy of drug therapy

The second paper to which reference may be made is by D. E. Robertson,<sup>2</sup> of Toronto. His views are definitely in support of conservatism. He urges that, if sulphonamide therapy is to be effective, it must be adopted early and in an amount sufficient to ensure saturation of body tissues, and he makes the significant observation that "incisional interference is not a factor in saving lives, and may be a very deleterious proceeding."

Such is an appreciation of the most recent opinions, and it seems clear that they support the value of complete conservatism in the acute stages of osteomyelitis occurring in childhood

It is interesting to note that comparatively little reference is made to the value of penicillin in the treatment of acute osteomyelitis. Dennis alludes to reports of Florey and his group on the results obtained in three cases, and he records the benefit which accrued. It is beyond question, of course, that the drug is of enormous value in the acute stages of the disease; on the other hand, it appears to have less effect in the chronic state, probably for reasons very similar to those which invalidate the action of the sulphonamides at this period. Up to the present the opportunities for estimating the value of penicillin in the treatment of acute osteomyelitis encountered in civil practice have been meagre, but, as an increasing supply of the drug becomes available, and the readjustment to peace-time conditions is possible, reliable records will be available, and, so far as present knowledge goes, there seems every reason to anticipate confirmation of the encouragement which is offered by existing reports

REFERENCES -1J-Lancet, 1943, 63, 184, Ann Surg 1943, 118, 918

T P McMurray, FRCS

The extent to which surgery should be employed in the treatment of acute hæmatogenous osteomyelitis has been the subject of much debate and considerable diversity of opinion. It was formerly agreed that the only safe method of dealing with the acute and dangerous infection of acute osteomyelitis was the wide opening or guttering of the infected bone, by which the medulla was widely split and the intermedullary tension relaxed. Latterly the more conservative opening of the medulla by drilling in the region of the metaphysis has become more popular, and some surgeons have held the view that sufficient relief of tension and infection can be gained by the simple splitting of the periosteum. Unfortunately these two more conservative methods, although attractive on account of the comparative absence of shock, are not always sufficient to stop the spread of the infection, and after their employment more

radical measures are often necessary at a later date with the patient in a low-ered state of health.

Since the recognition of the success of chemotherapy in the treatment of pyogenic infections of other tissues, attempts have been made to treat acute bone infections simply by these reagents without the help of surgery. In an analysis of the results obtained by the use of chemotherapy as an aid to surgery, K. C. McKeown<sup>1</sup> describes the results in a series of 100 patients suffering from acute osteomyelitis. Twenty-six of these patients had been treated with sulphathiazole combined with various types of surgical intervention, and with the object of assessing the results a comparison is made with the 74 other patients treated for the same condition by the same types of surgery, but without the help of sulphathiazole. In his classification McKeown divides the patients into four groups

Group 1 —Sulphathiazole was given in daily doses of 1 gr per 20 lb. bodyweight. Administration of the drug was commenced as soon as the condition of osteomyelitis was recognized, and was continued for 8 days. After an interval of three weeks a repeat course of similar dosage and duration was given. This system of administration was instituted to prevent the ill effects of prolonged absorption of the drug. Operative treatment consisted in making multiple drill holes in the metaphysis, and was carried out between the second and sixth day of the disease. The closed plaster technique was adopted

Group 2—Cases were given sulphathiazole in adequate doses, but surgical intervention was minimal. In the first case no operation was carried out in the acute stage of the disease, and in the other cases the periosteum only was incised.

Group 3 —Sulphathiazole was given in two courses as in Group 1, but the operative treatment consisted in incision of the periosteum and extensive bone drilling

Group 4—This was made up of those patients in whom bone drilling was carried out, but sulphathiazole was either given in very small doses, or its administration was not started until a considerable interval had elapsed following the onset of the disease

In the investigation McKeown arrives at certain conclusions, of which the first and most striking is the limitation in the spread of the bone infection which resulted from the early administration of sulphathiazole in those patients who had also been treated by bone drilling In these patients the destructive bone changes were confined to a relatively small area, the severity of the infection was at the same time diminished—as indicated by the patient's general condition and temperature—while the duration of the disease was, as a rule, remarkably short. Secondly, when sulphathiazole was given at a late stage of the disease, or in small doses, as in Group 4, the favourable features observed in Group 1 were not obtained, although the surgical procedures were Thirdly, early administration of sulphathiazole was not in itself sufficient to limit the severity of bone infection, unless its administration was combined with surgical measures. A résumé of the patients in Groups 2 and 8 appears to indicate that simple incision of the periosteum does not provide sufficient drainage, while the proceeding of bone guttering appears to be unnecessarily extensive and even harmful

The Role of Chemotherapy in the Early and Late Stages of the Disease.—It is obvious from the histories of the patients treated that, in order to be effective, the drug must be given in the early stages of the disease Early administration secures the bacteristatic effect of the sulphonamide before the infection becomes firmly established and thereby local and general defensive systems have time to become. By this means the severity of the bone lesion is limited, in administration ensures that the drug is able to

reach the site of infection before pressure and thrombosis interfere with the vascular supply of the affected metaphysis. As a corollary of the above considerations it may be inferred that chemotherapy will be less effective in the chronic phase of osteomyelitis, where the bone is sclerosed and avascular. In order to decide this point a group of 15 patients suffering from chronic osteomyelitis were given adequate doses of sulphathiazole for periods varying up to 2 weeks. Four of these patients responded, as indicated by diminished amounts of discharge from the sinuses, while sulphathiazole was being given, but after the administration of the drug was discontinued the discharge was as copious as before. In the other 11 patients no change was noticed in the general or local conditions, even during the administration of sulphathiazole

Experimental studies carried out mainly in America suggest that to be effective a blood concentration of 2.5 mg per cent must be obtained if the full effect of the drug is to be gained. Valuable data on the effect of the drug were obtained from periodic examination of the urine. From this it was found that albuminuria appeared when the blood concentration rose to 6 mg per cent. In some instances examination of the urinary specimens disclosed the presence of urobilin and porphyrins, a find which suggests that the primary damage caused by the drug may be hepatic rather than renal. It was found also that by the administration of nicotinic acid together with sulphathiazole a much greater blood concentration could be procured without producing albuminuria, and using this method it was found possible to raise the blood sulphathiazole concentration to 10 or 11 mg. per cent without causing any apparent injury to the renal or biliary system.

This article should be of considerable help to surgeons who deal with this troublesome condition. The reactions of a sufficient number of patients have been observed to make the study valuable, and the record of improvement under the combined treatment of surgery and chemotherapy is one of which note must be taken.

REFERENCE -1Brit J Surg 1948, 121, 13.

#### PANCREAS, SURGERY OF. (See also Duodenum, Carcinoma of)

A Rendle Short, M.D., FRCS

Ruptured Pancreas.—The pancreas does not often suffer injury, but it may be damaged by a gunshot wound, or torn by a severe crushing accident. A diagnosis on chinical evidence is seldom possible, but H C. Naffziger and H J. McCorkle, of San Francisco, found in 6 cases that there is a significant rise in the serum amylase, coming on a few hours after the damage to the pancreas is inflicted, and persisting for two or three days

Pancreatic Fistula.—T. B Wiper and J. M. Miller,<sup>2</sup> of Staten Island, present a study of 8 cases Large amounts of water and sodium carbonate may be lost to the body, and physiological saline (not alkalis) should be given to replemish the loss. Anæmia is a striking feature, and must be treated by whole-blood transfusions. They recommend collecting the lost pancreatic fluid, and giving it to the patient to drink flavoured with grape juice. The diet should be high in fat and low in carbohydrate, with added vitamins, iron, and calcium. Ephedrine may reduce the flow. A suction apparatus should be arranged to collect the fluid, and a thin aluminium paste painted on to protect the skin. A good many pancreatic fistulæ will close without operation

Carcinoma of Pancreas.—According to Naomi Kaplan and A Angrist,<sup>3</sup> of Long Island, jaundice is not due to mere compression of the bile-duct, but to fixation, and to stenosing annular carcinomatous involvement of the duct wall. Early laparotomy is indicated, because resection may be possible, and sometimes painless jaundice is caused by a stone in the duct.

Total pancreatectomy for carcinoma is occasionally possible E. W Rockey, of Portland, Oregon, reports a case. The patient showed severe signs of hypoglycæmia, with convulsions and coma, after the operation He lived a fortnight

REFERENCES — Ann Surg 1943, 118, 594, Ind 1944, 120, 52, Surg Gynec Obstet 1943, 77, 199, Ann Surg 1943, 113, 603

# PAROXYSMAL TACHYCARDIA. (See ARRHYTHMIA)

# PATENT DUCTUS ARTERIOSUS WITH SUBACUTE BACTERIAL INFECTION. (See also Heart Disease, Congenital; Radiology.)

A Tudor Edwards, M Ch., F.R C S

Increasing interest has developed in ligation of the patent ductus arteriosus since it was first successfully performed by Gross and Hubbard in Boston, USA, in 1989

Examination of a child apparently in perfect health with a typical thrill and murmur would hardly suggest that the average age of death was 24 years in such children, that fully 30 per cent will develop subacute bacterial infection, and that cardiac failure would be the cause of death in 80 per cent. The result of successful ligature with low mortality, with an appreciation of the risks run, has led to considerable variation in the views of cardiologists as to the indications for operation in uncomplicated cases. The evidence of increasing ventricular hypertrophy or of subacute bacterial infection is an obvious operative indication.

 $\mathbf{P.~W~Gebauer^1~divides}$  cases uncomplicated by the above-mentioned conditions into four groups —

Patients in whom dilatation of the pulmonary artery is a prominent feature. This is the essential change, adding to the operative difficulties of safe ligation of a large, short, thin-walled, and sometimes sclerotic ductus, which may reach a size of twice the aorta, and be so distended as to approach transparency in the thinness of its walls. Even in the cases of successful dissection there is always the possibility of subsequent erosion. In this author's opinion operation in such cases has least to offer

- 2 Patients ranging from the ages of fourteen to the late twenties who have led active lives but now complain of increased heart consciousness, palpitation, and dyspnœa on exertion—In such cases the cardiac reserve is almost exhausted and the pulmonary artery is larger than the aorta—The ductus is subpleural, thin-walled, and about 5–8 mm—long and of the same width—Sometimes there is room for only one ligature, and if this is tight enough to produce internal approximation and permanent healing there is some risk of immediate hemorrhage, and late hemorrhage by erosion or false aneurysm formation is an unfortunate possibility—If the ligature is tied loose enought to prevent vessel-wall injury the functional result may be good, but the murmur continues or recurs and the leak continues—The hazard of infection is still present if not actually enhanced—For these reasons simple ligature is unjustified in some of the patients
- 3 Patients are usually more than three years and rarely more than twelve or fourteen years of age. They have minimal symptoms, a thrill may not be palpable. The blood-pressure is within normal range but an increased pulse-pressure can almost always be elicited following severe exercise.

In this group of patients the ductus can be ligated completely, safely, and permanently, and the operation should be regarded as a prophylactic measure Once a patent ductus has persisted for three years or more with enough leak to permit a good climical diagnosis, it is unlikely that spontaneous closure will

ever occur Pulmonary artery and ductal dilatation gradually progresses until surgical closure becomes difficult and finally impossible by present methods. The risks of operation are minimal

4. The fourth type is patent ductus complicated by bacterial endarteritis. In this group O S. Tubbs and associates published the first successful case in 1941. A series of 9 cases has subsequently been reported by Tubbs, 2 all of which had subacute bacterial infection. Of these only one died following operation, but a further two patients died two months and four months later

This is a remarkable series bearing in mind that the disease has been fatal with exceedingly few exceptions, death supervening from one month to two years after the onset of infection. In fact, there are only two cases on record (W. Chester, A. S. Touroff and L. R. Tickman in which recovery has taken place without operation, and infection recurred in one of these twelve years later

Full details of the operative technique are included in Tubbs's paper, and a full account is given of the clinical course in 9 patients. Satisfactory occlusion of the duct is indicated by the disappearance of the thrill and the rise of the disatolic blood-pressure. One of the cases in which recovery from the bacterial infection was complete had a persistent murmur, including that part extending into disatole, although less loud than before operation. It has naturally been suggested that it is due to incomplete obliteration of the duct, but Touroff reported such a condition in one of his cases in which accidental hæmorrhage at the time of operation necessitated division of the vessel between ligatures

REFERENCES — Austr and N Z J Surg 1943, 13, 75, \*Brit J Surg 1944, 32, 1, \*4mer Heart J. 1937, 13, 492, \*Ind 1942, 23, 857.

#### PEDICULOSIS. R M B MacKenna, M A, M D, F R C.P

One of the permanent benefits which may arise from the present war is that the incidence of lice among the population of the United Kingdom—an incidence which can but cause dismay to those who pause to consider the matter—may be reduced to negligible proportions.

In 1941, K. Mellanby<sup>1</sup> published the results of an investigation concerning the incidence of head lice in England These results, which dealt mainly with the period before the outbreak of the war (1989), indicated that lice were very common among large sections of the population, and that as many as 50 per cent of the girls under fourteen years of age in our industrial cities had lousy heads Mellanby<sup>2</sup> has now published the results of a similar study prepared during the first four years of war, his paper is based upon approximately 85,000 individual examinations, made in seven large cities and three county boroughs, and indicates that between the outbreak of war and September, 1948, the incidence of head lice among girls aged 1-13 years has not fluctuated to any degree Among girls of 14-18 years, there was a considerable rise in incidence during 1941 and 1942, but this increase was checked, and in 1943 the incidence in this group fell; a similar but much less marked rise and decline in incidence was noted among boys between 5 and 8 years Mellanby suggests that working conditions and the shortage of shampoos may have been responsible for the rise in incidence in the group of adolescent girls. Despite these fluctuations, the conclusion is reached that the proportion of children whose heads are infected with lice has altered very little during the first four years of war Any change has been for the better, but in the industrial cities of England nearly 50 per cent of pre-school-age children of both sexes and approximately the same number of schoolgirls are still verminous Females over 18 show an increase in lousiness from 86 per cent during the pre-war period to 124 per cent in 1942. In males the incidence of head lice during the war years has not increased.

Mellanby makes the serious allegation that many school medical officers are still greatly underestimating the gravity of the head-louse situation. In view of the introduction of *lethane* hair oil by J. R. Busvine and P. A. Buxton, much more satisfactory results should by now have been obtained, particularly in view of the efforts of the Ministry of Health to ensure that adequate supplies are maintained

It is not generally recognized that pediculosis capitis may be treated with emulsions of benzyl benzoate E. Blackstock advocates the use of "Ascabiol (new formula)"—a proprietary benzyl benzoate emulsion—for this purpose. The head is painted with the preparation, washed next day, and inspected one week later.

For the treatment of infestations with crab lice (Phthrus pubis), K. Mellanby has advocated the use of an emulsion made by melting 20 g. of lanette wax SX on a water bath, adding 50 ml. of technical lauryl thiocyanate, heating the mixture to approximately 65° C, and then pouring it into 950 ml of water which had previously been heated to a similar temperature. To obtain emulsification the mixture must be stirred until it is cold. This emulsion can be applied without shaving of the affected areas, and only one application is necessary. The clothing and bedding are best disinfected. Mellanby gives the warning that "technical lauryl thiocyanate" is a commercial product and not a pure substance, all batches may possibly not be equally effective insecticides.

S M Peck, W H Wright, and J Q Grant' have published their observations on cutaneous reactions due to the body louse (Pediculus humanus corporis) They noted that the type and intensity of the local reaction of the skin varied not only with the individual but with the number of the lice fed, and the When as many as length of time over which the feedings were continued 200 lice were fed daily, little or no pruritus was experienced during the first week of exposure, after feeding periods of from seven to seventeen days an immediate reaction was noted which consisted of a diffuse redness or the appearance of scattered papular urticarial lesions at the feeding sites One volunteer fed a very large number of lice for a period of fifty days inflammatory reaction became increasingly severe, and finally she developed a generalized papular eruption and the feedings had to be discontinued. Several days later she fed a single louse on the forearm and the generalized eruption reappeared. Another volunteer had had pediculosis pubis five years previously and developed a definite inflammatory reaction following the first feeding of the lice

There appear to be considerable individual variations in the cutaneous reactions to body lice, but these results have interesting parallels with those recorded concerning scables. In scables a latent period of approximately four weeks occurs before the symptom of itching is noted; in pediculosis these authors note a latent period of a week. The immediate reaction to the parasite which occurs in a second infestation of scables and the immediate reaction experienced by the volunteer who had had pediculosis pubis five years previously, is an interesting coincidence, it scarcely can be rated higher than a coincidence, for Pediculus humanus corporis and Phthirus pubis are different genera of lice, whereas, in Mellanby's experiments, Sarcoptes of the same species were used throughout (see Scabies) Peck and his coworkers suggest that there are two components in the reaction to louse bites, firstly a purpuric reaction due to the act of feeding, and secondly an inflammatory reaction which occurs as a result of sensitization They state that the pruritus which accompanies infestation with lice seems to be mainly a part of the syndrome of hypersensitivity, and indicate that in their opinion the fæces of the louse play an important part in the production of this reaction. D.D.T.—The introduction of a new synthetic insecticide known as "DDT" is of epoch-making importance. The formula for this is stated to be 2, 2-bis (parachlorphenyl) 1, 1, 1,-trichlorethane, the compound is known as DD.T. from the generic name dichlor-diphenyl-trichlorethane. The graphic formula has been stated to be—

We have the authority of the Journal of the RAM C <sup>10</sup> for stating that in 1942 the British Military Attaché at Geneva called the attention of our Government to the preparation which was being manufactured by the Geigy Company of Switzerland Like many other useful chemicals, it had first been discovered many years ago (1874), but its toxicity to insects remained unsuspected until 1989 or 1940. DDT is practically insoluble in water but dissolves in many organic liquids, it is non-volatile and stable. The impregnation of clothing with 1 per cent DDT has been proved to be an extremely satisfactory method of preventing louse infestation, and because of the insolubility of the compound in water the impregnated garments may be washed on several occasions before re-impregnation is necessary. Experience in Italy has shown that anti-louse powder containing 5 per cent DDT is extremely efficacious; the method of application used may be quite crude, the powder being blown with an agricultural type of dusting gun down sleeves and into clothing which the patient does not have to trouble to remove.

DDT powder is lethal to head lice, body lice, and crab lice. The risk of causing dermatitis by its use appears to be but small. It is hoped that when it is available in sufficient amounts its widespread employment will ensure that never again will a scientist be able to publish such appalling figures concerning the verminous state of the children of England as are quoted in the early part of this annotation.

REFERENCES — Med Offr 1941, 65, 89, "Ibid 1943, 70, 205, "Brit med J 1942, 1, 464, 4 Control of Head Lice, MOH Memo 230A/Med, 1943, "Brit med J 1944, 1, 114, "Ibid 720, "J Amer. med Ass 1943, 123, 821, "Brit med J, 1944, 2, 217, "Ibid 262, "DJ R Army med Cps 1944, 83, 34

# PENICILLIN: A REVIEW. J S. Jeffrey, MA., MD, F.R C S Ed

The present general interest in penicillin, and the vast increase of production, is causing a mounting testimony to its powers and its limitations in clinical conditions. Historically, the discovery of the drug was first announced in 1929 by A. Fleming,¹ and its astonishing properties were revealed in 1940 and 1941, when the Oxford workers (H W Florey, E P Abraham, E Chain, C. M Fletcher, A D. Gardner, N G Heatley, M A Jennings, J Orr-Ewing, and A G. Sanders².³) succeeded in producing a stable extract of the active principle, and demonstrated by animal experiment and clinical use that penicillin belongs to that rare class of drug—the true chemotherapeutic agent. Since 1941 many further studies have been made in Britain and America, and it is a remarkable tribute to the original laboratory workers that, long before the drug was first used on any human patient, almost all the essential facts as regards the types of infections likely to benefit and the dosage and technique of administration which we now apply, had been worked out in the laboratory

H W. Florey and M. A Jennings' review the principles of penicillin treatment in an issue of the British Journal of Surgery specially devoted to penicillin. Penicillin is an acid, but it rapidly loses its activity in acid form and is supplied for clinical use in the form of its sodium or calcium salt. The salts are equally efficacious, but calcium penicillin is less hygroscopic and is therefore easier to handle and less hable to deterioration. Even in the form of its salts penicillin is more hable to loss of activity than other drugs commonly handled in clinical use. It is destroyed by acid and alkali, by the heavy metals, by alcohols, and by oxidizing agents. Since most of the common antiseptics fall into one of these categories, penicillin must be used alone, or if any preliminary cleansing of a wound is necessary it should be done by soap and water, saline, or Cetavlon. It loses activity when heated above body temperature and should be stored in the cold. Penicillin is also destroyed as members of the coliform and subtilis-mesentericus group.

Mode of Action.—The present evidence is that the action of penicillin is bacteriostatic and not bactericidal. Morphological studies suggest that penicillin, without killing the bacteria, interrupts cell division. As soon as the influence of the drug is removed the remaining bacteria are able to resume multiplication. For that reason penicillin must be kept continuously in contact with all infected tissues until the natural body defences have had time to deal with the infection. Since the drug is rapidly excreted from the body this necessitates repeated and continuous administration. Its action is not appreciably impaired by serum, blood, pus, or tissue autolysates, and this ability to act in the presence of pus is one of its great advantages over the sulphonamides.

Sensitive and Resistant Bacteria.—In general, the Gram-positive organisms and Gram-negative cocci are sensitive, and the Gram-negative bacilli insensitive Naturally resistant staphylococci are occasionally encountered, but no naturally resistant strains of Str. pyogenes have yet been reported. As with other antibacterial drugs, resistance can be built up in vitro, or in vivo in animals, by doses which are not large enough to prevent growth completely, but in clinical practice this is fortunately not common. The mechanisms of resistance to penicillin and to sulphonamides are different, since sulphonamide-resistant strains are sensitive to penicillin, and the reverse has been shown.

Organisms Sensitive to Penicillin N. gonorrhææ; N meningitidis; Staph albus and aureus (occasional insensitive strain), Str pyogenes; Str. viridans (most of the pathogenic strains are sensitive); Str pneumoniæ; Cl welchi, Cl ædematiens, Cl septique, B anthracis, C. diphtheriæ; Trep pallidum, Trep recurrentis, Leptospira icterohæmorrhagiæ (probably sensitive though variation); Virus of ornithosis and psittacosis, Virus of lymphogranuloma inguinale

MODERATELY SENSITIVE. Vibrio El Tor, S gærtneri.

INSENSITIVE: Ps pyocyanea, Proteus, B coli, B typhosus and paratyphosus, Str. fæalis and some other strains of Str viridans, Occasional strains of staphylococcus; Listeria

Absorption and Excretion.—Since penicillin is destroyed by acid in the stomach, it cannot be given satisfactorily by mouth. For systemic administration the intramuscular route is the method of choice. Little is gained by intravenous injection, as after intramuscular injection maximum concentration is reached in the blood within 15 minutes. Excretion in the urine begins as soon as the penicillin reaches the blood-stream. In the 4th hour after a dose of 15,000 units a bacteriostatic concentration as a rule no longer exists

in the blood, so that the dose should be repeated 3-hourly Excretion is so rapid that possibly no advantage is to be gained by increasing the single dose above 15,000 units.

Systemic administration is the method of choice for most conditions, for thereby the drug will reach all parts of the body. The meninges, the pleura, and serous membranes of joints are relatively impermeable to penicillin, so that infections of these sites are best treated by local application.

## Administration and Dosage.-

A Systemic Treatment—Repeated 3-hourly intramuscular injections (120,000 units a day when the dose is 15,000 units) must be continued unremittingly for several days. The individual dose is readily dissolved in 2 c.c. pyrogenfree normal saline or distilled water. The constant injections can be trying to the patients, and the impurities in the preparation may cause transient pain at the site of the injection, and rarely an urticarial reaction. Continuous intravenous drip (100,000 units in 4 pints saline in 24 hours) is comfortable for the patient, but thrombophlebitis usually occurs at the site of injection after 48 hours. Probably the most convenient method of administration is by continuous intramuscular drip (100,000 units a day in 100 c c saline). Apart from the above-mentioned ill effects, no toxic reactions have occurred in penicillin therapy.

In the systemic treatment of early or localizing infections, a course lasting 3 to 5 days may suffice. For a general or severe local infection treatment should be continued for at least 2 to 5 days after the infecting organism can no longer be found by bacteriological methods. In a condition such as staphylococcal septicæmia the total period of treatment is seldom less than 10 days, and may be much more. The only condition which appears to be cured by treatment lasting 24 hours is gonorrhea.

B Local Treatment —The same general principles hold good for local as for systemic use, i.e., a continuous concentration of the drug must be maintained in contact with all infected tissues until the infection has been dealt with by the cellular and humoral defences. Every infected portion of tissue must be removed completely, as they will harbour organisms out of reach of the drug

Preparations.—The principal preparations for local use are —

- 1. Powder Dry penicillin (preferably calcium penicillin) is diluted with one of the sulphonamide powders to give a concentration of from 1000 to 5000 units per gramme. Dilution is necessary in order to spread the minute amount of penicillin required over a large area, and because pure penicillin powder locally applied can be necrotoxic. The sulphonamides are suitable as vehicles because they are less injurious to the tissues than other powders. The powder can be blown with an insuffiator on to raw surfaces to form a thick hoar-frost. The application should be repeated every 24 hours, and is only of real use on relatively dry surfaces, as blood or exudate rapidly washes it away Calcium penicillin powder retains its potency for many months, even at room temperature
- 2 Cream Penicillin can be incorporated in a cream of 30 per cent lanette wax in water, at a strength of 250 units or more per gramme Or it can be dispensed as follows —

Arachis oil . 125 c c
Lanette wax SX . 60 g
Water . 275 c c

Heat sterilized oil to 70° C Add wax Heat water to 60-65° C. Add water to wax and oil with gentle stirring Maintain at 65° C for 2 hours to sterilize Store in 100-g pots in refrigerator till needed. Before use add, mixing well, 25° c of penicilia solution of 10,000 units/c.c., in closed room, or better, under cover of glass cage This gives a cream of 250 units per gramme

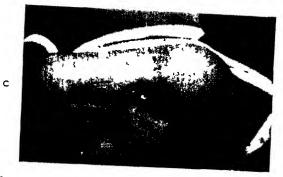
# PLATE XXVI

# PENICILLIN IN FRACTURES

(J S JEFFREY)



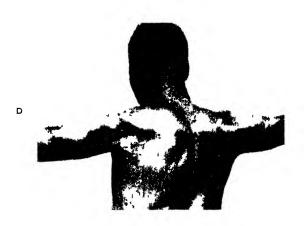




A, Fractured humerus with skin and muscle loss 5 days after wounding, immediately before wound excision Culture Staph aureus, Clostridia B Same case Six C Same case Six weeks after wounding Wound firmly healed

# PLATE XXVII

PENICILLIN IN FRACTURES—continued
(J S JETTREY)





D, E Same case Twelve weeks after wounding Fracture firmly united Deltoid loss, but good shoulder movement

# PLATE XXVIII

## PENICILLIN IN CHEST WOUNDS

(A L D'ABREU, J W LITCHTIELD, AND SCOTT THOMSON)



Fig. A—Radiogruph showing right effusion This had cont uned pus and streptococci 10 days presously I twas now sterile, and was evacuated by minor thoracotomy because of its content of fibrin



Fig. B.—Same case Radiograph taken 25 days after thoracotomy for 'clot clearance' Later radiographs showed complete resolution Rib resection and drainage avoided successfully



Fig C-Showing fibrin clot removed from chest

# PLATE XXIX

# PENICILLIN IN CHEST WOUNDS-continued

(A L D'ABREU J W LITCHTIEID AND SCOIT THOMSON)

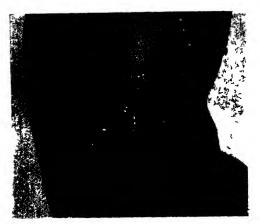


Fig. D.—Showing type of wound considered suitable for daily insufflations of sulphathazole-penicillin powder to reduce infection. The wound was infected by hemolytic streptococci



Fig E-Same case Two weeks after suture of wound shown in Fig D

Plates XXVI-XXIX by kind permission of the 'British Journal of Surgery'

These creams make good dressings for surface infections or deeper wounds, and need not be renewed more often than every 24 hours, or sometimes every 48 hours. A disadvantage is that lanette wax, which is ideal as a base for the penicillin, is an inert substance that requires mechanical removal from the tissues. Penicillin cream should be stored at a temperature of about 5° C., and will probably deteriorate within a fortnight

3 Solutions—These can be made up in distilled water or saline at 250 units per c.c. for instilling 12-hourly through fine rubber tubes into wounds which have been closed, for injecting into abscess cavities; and as a spray for skin and mucous membrane infections. Solutions of a strength of 1000 to 2000 units per c.c. are suitable for injecting into the cerebrospinal, pleural, and joint cavities, and for 2-hourly drops for the eye. Penicillin in solution rapidly deteriorates. If kept at room temperature the solution should be made up fresh daily. At 5° C solutions will keep for 2-3 days

#### CLINICAL APPLICATION

Shortage of supply has meant that penicillin has usually been reserved for the more serious clinical conditions. The effect of this is that many lesser complaints for which penicillin is probably eminently suitable have not yet been widely investigated. Such conditions as local staphylococcal and streptococcal infections of the skin, boils, secondary infections of burns, infections of the hand, of the eye, and of the ear, nose, and throat, and others, appear to respond well to penicillin treatment according to isolated reports. From Britain most of the reports have been concerned with battle casualties because the drug has been reserved largely for service cases. Economy has led to the development of local penicillin therapy, which in some conditions has proved as effective as systemic therapy as well as more comfortable for the patient.

From America have come valuable reports of large-scale investigations of civilian conditions, and a more widespread use of systemic treatment. In both countries the indications for treatment seem to be appreciated, i.e., in infections due to susceptible organisms. The points about which there is no universal agreement are the questions of dosage, the best method of administration, and the duration of treatment. The final answer will resolve itself with the study of more cases.

The question is already being asked, and the note of doubt sounded, whether penicillin has done all that was predicted of it. On the whole, it can be said to have done most of what it was legitimate to expect. In infectious by the most susceptible organisms-gonococcus and meningococcus-the results have been brilliant Against infections by pyogenic organisms such as staphylococcus and streptococcus the results are better than was ever achieved before Nevertheless, although these organisms are susceptible, it has not proved possible to avoid many of their ill effects Pus still requires drainage negative infection appears to flourish when the Gram-positive organisms are brought under control by penicillin, and such organisms as programes proteus, and coliforms are proving obstinate opponents Many in bone infections have been disappointing. The treatment endocarditis by penicillin has so far been a history of failure; is the picture in venereal diseases, where for the first time that appears effective against both gonorrhœa and syphilis nothing else than guarantee a quick and sure cure for gone and the discovery of penicillin would be regarded as a medical milestone, and the prospect eradication this disease from the country is one that should dazzle and stillate the Papine Health authorities.

Soft-tissue Wounds.—The topical application of penicillin to soft-tissue wounds has allowed a quicker healing of wounds than has hitherto been possible. F H Bentley, in performing early secondary suture in 252 wounds among soldiers in Italy, obtained primary healing in 240—95 per cent. The technique of penicillin application was (a) For superficial wounds, if clean—a single insuffiction of penicillin-sulphathiazole powder (5000 units per gramme) and suture, (b) For superficial wounds, if dirty—preliminary insuffiction once daily, for 2–3 days, then suture over a further frosting; (c) For deep wounds where the powder could not reach all crevices—suture and instillation through fine indwelling rubber tubes, 3 c c down each tube twice daily for 4 days, of penicillin solution, 250 units per c c. It was estimated that the time of healing of a medium-sized soft-tissue wound was 6 weeks if successfully sutured, and 12 weeks if allowed to granulate or repaired at a later date. The saving in man-power through early secondary suture of wounds is considerable, for soft-tissue wounds make up about 50 per cent of all battle casualties.

Compound Fractures.—Penicillin has a place in the management of compound fractures, since they are usually infected at an early stage with Staph aureus and clostridia. Particularly is this so in battle-casualty fractures, which seldom reach a Base hospital for definitive treatment in less than 5 days from wounding. R Furlong and J. M. P Clarks report a series of 140 fractures of the femur sustained by missiles in Italy 70 were treated with penicillin and 70 with sulphonamides. The course of systemic penicillin lasted 5–14 days (average 800,000 units in 8 days). The patient was "penicillinized" for 24 hours before definitive treatment was carried out. This consisted of surgical revision of the wounds and partial suture, and immobilization by skeletal traction and Thomas's splint. There was a reduction in serious infection in the penicillin series, as seen in the death and amputation figures.—

140 OPEN FRACTURES OF FEMUR

	Number	DEATHS	AMPUTATIONS		
Contrasts	70	6 (8 5 per cent)	6 (8 5 per cent)		
Penicullun	70	1 (1 4 per cent)	2 (2 8 per cent)		

Although major sepsis and its effects were minimized, there was persistent minor infection, as evidenced by a sinus down to bone after 3 months, in about one-third of the penicilin series, which is similar to the infection-rate of the contrast series. It is probable that a routine penicilin course and partial wound suture should be part of the treatment of most compound fractures. In performing wound suture it is important to leave adequate drainage for the autolytic products and Gram-negative pus—anterior wounds can be safely sutured, but posterior and main drainage wounds should only be sutured in any part well away from the main drainage channel. (Platess XXVI, XXVII)

Gas Gangrene.—All workers emphasize that while penicilin has a definite place in the treatment of gas gangrene, radical surgery remains the keystone. In a consecutive series of 33 cases of gas gangrene (anaerobic myositis) treated with systemic penicilin in Italy, J. S. Jeffrey and S. Thomson, note a fatality-rate of 36 per cent. This is a slight reduction in the previous fatality-rate in Italy of 50 per cent. Of, these 33 cases, 5 were too advanced to permit of surgery, and all died quickly. The other 28 received full treatment with surgery, gas gangrene antiserum, and penicilin, and 7 died (25 per cent). It is emphasized that while penicilin can deal with the clostridia at the advancing edge, it cannot gain access to gangrenous tissue which no longer has a blood-supply, so that radical surgery is necessary to remove the gangrenous muscle,

and antiserum to counteract the toxæmia With full treatment it is possible to arrest the progressive myositis, though late ill effects must be anticipated, notably uræmia through damage to the kidney from retained dead-muscle products

The ability of penicilin to prevent onset of gas gangrene when given prophylactically is open to question. Since penicillin cannot penetrate into devitalized tissue, it is probable that gangrene can develop in muscle deprived of blood-supply, but should remain localized close to that area. E. C. Cutler and W. R. Sandusky<sup>8</sup> describe 5 cases of war wounds that received a course of penicillin immediately following primary excision. In spite of prophylactic administration of penicillin gas gangrene developed. However, after surgical extirpation of the diseased tissue, gas gangrene antitoxin, and continued penicillin therapy, each one recovered.

Intrapleural Infections.—All who have used penicillin in the treatment of empyema have found that intrapleural instillation is the method of choice In the treatment of the infected hæmothorax of the penetrating chest wound, and in subsequent empyemata, A L d'Abreu, J. W Litchfield, and S. Thomson found this method more useful than systemic medication alone, and combined it with systemic therapy only when the toxemia was profound or when there were associated lesions outside the pleura They comment on the capacity of the pleural cavity to retain instilled penicillin for as long as three days, and their treatment of established infection was to aspirate the chest and instil penicillin in solution at 48-hour intervals For average cavities holding from 10 to 20 oz of fluid, 60,000 units penicillin was the dose given (1000 units per cc saline), 120,000 units was given for total empyemata, and 30,000 units for small pockets Three or four aspirations and instillations usually sufficed Patients with much air in the pleural cavity were postured for 3 hours on each side so as to distribute the penicillin widely In only 1 of 14 cases of empyemata following battle-casualty penetrating wounds of the chest was there failure to control infection even in the presence of thick offensive pus Considerable skill and patience in the repeated aspirations were required to get the drug to the right part, and thereby some thoracic empyemata were cured without Thoracotomy was sometimes required for clotted hæmosurgical drainage thorax and for evacuation of pus and fibrin, and complete closure was carried In cases where rib resection and surgical drainage was performed, penicillin was instilled along the tube which was then occluded by a spigot for several hours D'Abreu et al also got great satisfaction from the closure with local penicillin of large septic chest-wall wounds. In their 64 penetrating and chest-wall battle wounds treated with penicillin there were no deaths. In a contrast series there were 6 deaths in 40 cases (Plates XXVIII, XXIX.)

E. C. B Butler, K M A Perry, and F C O Valentine<sup>10</sup> describe their experiences with 17 cases of civilian empyemata. The results were satisfactory except in cases of bronchopleural fistula, which kept re-infecting the cavity and ended fatally. Penicillin normally sterilized the pleural cavity and rendered the patient less toxic, but aspiration alone was usually insufficient and rib resection was necessary to remove masses of fibrin. If intrapleural pus cannot be adequately aspirated surgical drainage should not be over-long delayed, for fear of permanent thickening of the visceral pleura.

Head Wounds.—H Carrns<sup>11</sup> describes the methods that he and his associates have been employing in the treatment of gunshot wounds of the head. Penicillin has proved useful, but only when it had followed surgical excision of dirt, hair, bone chips, pulped brain, blood-clot, and accessible missiles. His methods are —

1. In recent brain wounds (up to 72 hours) pencellin is applied as a powder (5000 units per gramme of one of the sulphonamides) followed by primary

closure In 129 cases so treated fatal infection developed in only 2 cases, which probably represents a new low level for deaths from sepsis in brain wounds

- 2 In older brain wounds where pus is already present, penicillin is applied as follows (a) After excision and primary closure of the wound Seitz-filtered penicillin solution (250–1000 units per cc) can be instilled through tubes twice daily for 3–5 days, of 23 old brain wounds so treated only 3 subsequently showed major intracranial infection (b) The wound can be cleaned surgically and left open for 2–3 days with daily application of penicillin powder; secondary suture can than be performed (c) If the scalp is grossly infected, the wound is excised, the scalp is partially closed, and a 3-day course of systemic penicillin given.
- 3 In ventricular wounds, following surgical toilet of the wound, penicillin solution (1000 units per c c) is injected into the ventricle or lumbar theca in amounts of 4000–8000 units once daily for as long as there is a suspicion of ventricular infection
- 4 Abscesses arising in a brain wound within the first few weeks of injury should be treated by open drainage, and twice daily instillations of penicillin solution through an indwelling tube
- 5 Closure of non-penetrating wounds of the head after excision (including removal of bare bone) and insuffiation of penicillin powder is followed by primary healing in 95 per cent of cases Careful hæmostasis is required before closure to prevent the powder being washed away by the blood

Pneumococcal Meningitis.—Before 1937 pneumococcal meningitis carried a very high fatality-rate Since the introduction of the sulphonamides recovery rates as high as 30 per cent and 40 per cent have been reported. Using penicilin, H Cairns, E S Duthie, W S Lewin, and H V Smith12 treated 16 cases of pneumococcal meningitis, with 12 recoveries The cases had arisen after head injuries and sinus and ear infections They believe that since only minute amounts of penicillin pass through the barrier of the meninges after large doses systemically, the penicillin must be injected directly into the cerebrospinal fluid If there is no blockage of the cerebrospinal pathways by fibrino-purulent material, daily injections by the lumbar route will often suffice and the penicillin will diffuse into the ventricles and cerebral subarachnoid space If, however, there are signs of spinal block due to adhesions it is necessary to supplement with injections into the lateral ventricles through burr-holes Occasionally severe reactions followed injection into the lateral ventricles, with pleocytosis and short-lived meningitis were, probably due to impurities in the preparation and may not occur in future, but they are an indication against massive dosage The dose of 10,000 units daily for 4-7 days is recommended. The penicillin is injected as a solution containing 1000 units per c.c., it is prepared at twice this strength and diluted with an equal amount of the patient's cerebrospinal fluid before injection. Cairns et al found that sulphonamides had a considerable controlling influence in their cases, and they recommend the additional use of sulphadiazine, or, in hot countries, sulphamethazine

In all injections of penicillin solution into the cerebrospinal pathways or brain tracks the solution should be passed through a Seitz filter, and full aseptic precautions must be taken to avoid contamination with penicillin-resistant Gram-negative organisms. Fatal cases of *pyocyaneus* meningitis have occurred in some clinics

Cerebrospinal Fever.—Excellent results can be anticipated in meningococcal infections. D H Rosenberg and P A Arling<sup>13</sup> treated 76 cases of meningococcal meningitis, with 75 recoveries. This compares with the 90 per cent recovery-rate with sulphadiazine. The initial diagnostic lumbar puncture

was performed in the usual manner and the spinal canal was drained; 10,000 units of penicillin, dissolved in 10 c c isotonic solution of sodium chloride, was slowly introduced into the subarachnoid space. Penicillin (10,000 units) was administered intrathecally at 24-hour intervals until clinical improvement and fall in temperature, and until culture of the spinal fluid was negative. The course of treatment lasted from 2 to 5 days. In addition, a short systemic course for about 24 hours was given, 15,000 units 3-hourly intramuscularly.

Pneumonia.—The pneumococcus is very sensitive to penicillin, though there are strain variations. The results of treatment of lobar pneumonia are at least equal to, and probably better than, treatment with sulphapyridine, and are particularly satisfactory in cases of sulphonamide-resistant pneumonia. There have been no reports of success in treatment of "atypical pneumonia", which does not appear to respond to penicillin C. S. Keefer, F. G. Blake, E. K. Marshall, J. S. Lockwood, and W. B. Wood, "describing a large-scale penicillin inquiry by the National Research Council of America, mention 42 cases of pneumonia treated with penicillin, with recovery or improvement in 35, no effect in 1, and death in 6. M. H. Dawson and G. L. Hobby 15 noted dramatic response of pneumococcal pneumonia to quite small doses of penicillin (10,000 units every 4 hours for 1½ to 2 days), and death in one overwhelming infection.

Septicæmia.—C S Keefer et al 14 report on 91 patients with Staph aureus septicæmia Death occurred in 34 cases (37 per cent), and there was no demonstrable effect in 3 cases In the remaining 54 cases there was complete recovery or striking improvement. They state that without penicillin or sulphonamide therapy the fatality-rate of septicæmias is about 85 per cent, the patient usually dying in 10 to 14 days. In their penicillin series the most favourable outlook was in patients under 40 years of age who had an infection localized in an area that could be drained surgically, and who were not suffering from other debilitating disease There was recovery or improvement in 18 of 22 patients with osteomyelitis, in 9 of 10 patients with septicæmia without obvious port of entry, and in all 10 patients with infection of skin and These septicæmias were treated by a long and full subcutaneous tissues The blood-cultures quickly became sterile, but the best systemic course results were obtained when treatment was continued for at least 7 days after the temperature became normal The fatal cases occurred in those with deep-seated abscesses, in the elderly patients with other debilitating disease, and in every case where there were signs of bacterial endocarditis at the begin-W E Herrell, D. R Nichols, and D H. Herlman<sup>16</sup> ning of treatment describe 28 septicæmias (25 Stap aureus), with recovery in 25 (89 per cent). The three who died all had bacterial endocarditis at the time penicillin was R. V Christie and L P Garrod<sup>17</sup> also found that the development of an endocarditis in cases of septicæmia was a particularly unfavourable feature, so that penicillin cannot save every case of septicæmia

Endocardius.—In subacute bacterial endocarditis the picture is confused, but on the whole, the results have been disappointing. C S Keefer<sup>18</sup> states that of 55 cases of bacterial endocarditis treated with penicillin and reported to the National Research Council, only 8 patients are alive after one year of study. There may be temporary sterilization of the blood-stream and decrease in the fever, following the use of penicillin, but so far the improvement has rarely been permanent. L Loewe, P Rosenblatt, H. J. Green, and M Russell<sup>19</sup> record improvement in 7 cases out of 8 when penicillin was combined with heparin therapy; but in the eighth case 8 million units of penicillin was administered over 2 months without improvement. W. S Priest<sup>20</sup> questions the adequacy of dosage in previously reported failures, and mentions encouraging

results that are being achieved with large doses—200,000-800,000 units a day for three weeks. It is possible that large dosage may be the secret to less disappointing results, certainly the scale of penicillin dosage that appears adequate in other infections in the body is useless in subacute bacterial endocarditis

Osteomyelitis.—The combination of adequate surgery and systemic penicillin seems likely to be the standard future treatment of osteomyelitis. From different sources it is reported that in acute osteomyelitis a satisfactory result can be expected, though orthodox surgery for the local lesion is usually necessary. In chronic osteomyelitis the results can be disappointing unless one is prepared to go on with penicillin for a long period. The treatment of choice seems to be pre-operative penicillin for several days in order to prepare the field for intervention, then careful excision of all infected soft tissue and bone, followed by further systemic therapy for at least two weeks

C S Keefer et al. 14 state that of 55 patients with osteomyelitis 48 recovered or improved, and 7 showed no effect. By "recovered and improved" they meant that the wounds and sinuses healed completely while under treatment, or the exudate was nd of staphylococci and the lesion was healing. They admit that recurrences may occur later. L. M. Robertson 12 describes 7 cases of acute hæmatogenous osteomyelitis in children, with good result and healing by 6 weeks. Six were subjected to orthodox surgical treatment and drainage R. Mowlem 12 uses local penicillin solution in osteomyelitis of the mandible, and in 16 cases had recovery in an average of 30 days following excision of the sequestrating bone, wound suture, and instillations of penicillin through indwelling rubber tubes

Skin Diseases.—Penicillin may help some skin infections, applied either as a cream or as an hourly spray of penicillin solution (250 units per c c). I A Roxburgh, R V Christie, and A. C. Roxburgh<sup>23</sup> found it of obvious value when the infection was mainly staphylococcal and in clearing up secondary infection Eleven out of 12 cases of impetigo were quickly and completely cured, the individual lesions being cured in 4 days. Of 15 cases of sycosis barbæ of long standing, 5 were apparently cured, but the others were unaffected or relapsed in ottus externa the effect was not very striking because part of each flora was insensitive to penicillin. Blepharitis responded well to penicillin cream Some cases of chronic eczema with secondary infection were improved

Gonorrhea.—The gonococcus is the most sensitive of all organisms to penicillin, and in no other disease have the results been so consistently excellent as in gonorrhea J N. Robinson<sup>34</sup> details the results in 1000 cases of sulphonamide-resistant gonorrhea 947 per cent were free of gonorrhea after one course of 100,000 units of penicillin, given intramuscularly in 10,000-unit doses every hour, or in 20,000 units every three hours, 53 per cent of this series required a second course of penicillin varying from 100,000 units to 150,000 units, 7 per cent of the 1000 cases had developed complications other than posterior urethritis, and penicillin therapy hastened recovery in this group 100 cases of acute gonorrhea previously untreated received penicillin therapy with satisfactory results—97 per cent responded successfully to one course of 100,000 units of penicillin

None of these cases of gonorrhea received any other form of treatment whatever while being cured by penicillin, and it may be concluded that penicillin is the most effective agent we have for treating the disease. Other series of cases have been reported with similar findings to those of Robinson, the cure rate being usually about 95 per cent. It must be appreciated that 100,000 units will not cure all cases, and that recurrences are possible. In

cases not responding to two courses of penicillin a careful study of the genitourinary tract should be made. It will be noted that treatment for gonorrhoea rarely lasts longer than 24 hours, and can be given to ambulant and out-patients. The remarkable specificity of the drug has led various workers to try shorter courses and less units. A certain number of cases have apparently been cured by a single injection of penicillin, but in general, if less than 60,000 units is given in the course of 12 hours, the cure-rate falls below 75 per cent.

Syphilis.—J F Mahoney, R C. Arnold, and A. Harris<sup>25</sup> were the first to observe that penicillin has a marked spirochæticidal effect in both rabbits and human syphilis; and in this respect they were also the first to make any important observations that had not already been forecast by Fleming, Florey, and the other original laboratory workers Mahoney et al treated 4 patients, each of whom had a single penile chancre, by intramuscular injections of 25,000 units of penicillin at intervals of 4 hours until a total of 1,200,000 units had been given (48 injections in 8 days) Spirochætes were present in the lesions in all 4 patients before treatment, but were not demonstrable after 16 hours of treatment The patients all had positive serological tests for syphilis before treatment was begun The Kahn tests in the 4 patients became negative in 30, 36, 37, and 51 days respectively, and the ulcers all healed ın a few days One of these cases became sero-positive again after 9 months and developed a lip chancre, probably through a fresh infection

These findings have been confirmed by other workers, but no extravagant claims are made, for it is realized that several years may have to elapse before it can be said for certain that the patients are cured. A later report from Mahoney et al. 26 indicates that relapses do occur after penicillin therapy as at present conducted, though a cure seems likely if treatment is begun early Within 9 months 11 of 22 patients with secondary syphilis relapsed, but of 30 patients with primary syphilis only 3 relapsed. In tertiary syphilis there have been no reliable reports of cures, but there has been noticed regression of the gummatous lesions, and improvement of the cerebrospinal fluid findings.

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## PENIS, SURGERY OF.

Hamilton Barley, F.R.C.S.

E. D. Colvin and R. A. Bartholomew<sup>1</sup> perform circumcision in the newborn with a cautery They slit the prepuce with the cautery on a director, then apply a hæmostat to the resulting flaps, and remove the redundant foreskin with the cautery. Suturing is rarely necessary.

Local Anæsthesia of the Penis.—M Arnold² has performed 200 circumcisions in adults under nerve-block anæsthesia. The penis is pulled taut towards the patient's feet. A wheal is raised in the midline of the base of the penis an inch from the symphysis pubis. Twenty c c of 2 per cent novocain are then injected in the following manner: A needle is passed through the wheal upwards towards the pubis. It will be felt to pierce a fibrous resistance. After preliminary aspiration, 10 c c are injected. The needle is then thrust a little nearer the pubis, aspiration is again performed, and the remaining 10 c c injected. The area is massaged firmly for a few seconds

Although it sounds dangerous, M. A Magnd and O. S. Culp<sup>3</sup> obtain ideal penile anæsthesia by injection of 2 per cent procaine into the base of each corpus cavernosum (Fig. 39) They refer to blood transfusion being given

into the corpora, but they rightly point out that it is necessary to force the blood by syringe pressure. Be that as it may, they have had no reactions to 800 administrations and have obtained perfect anæsthesia of the whole of the penis. Ten c c. of a 2 per cent solution are injected through a No. 28 gauge



Fig 39—Cross-section of the penis, showing sites of procaine injection (After Magid and Culp)

needle An important point is that the needle having been introduced into the corpus, if blood is aspirated, the injection is not made at that point. The authors state that it is unusual to aspirate blood. [I have used this method of aniesthesia for amputation of the distal two-thirds of the penis for carcinoma (2 cases), and also in a case of irreducible paraphimosis. None of the patients experienced even a twinge of pain—H B]

Persistent Priapism.—In a case of persistent priapism W H Cave<sup>4</sup> tried aspiration and washing out the corpora cavernosa with saline A quantity of black, stringy blood was removed, and the patient was able to pass urine spontaneously. However, as is often the case, eight hours later the condition

recurred Cave therefore incised each corpus cavernosum and evacuated clotted blood. The incisions were packed with gauze and the wounds healed by first intention. The condition was cured

Induratio Penis Plastica.—O S Lowsley<sup>5</sup> finds treatment of induratio penis plastica by deep X rays and radium is not satisfactory. He has had most encouraging results in 6 out of 7 cases where operative treatment has been undertaken

A tourniquet is placed on the extreme face of the penis 'Strictly in the middle line, an incision is made from this point down to the sulcus behind the glans penis. The thickened tissues are entered through the septum between the two corpora cavernosa. The pathological fibrous tissue is then excised, care being taken to avoid entering the corpora cavernosa more than is necessary (Plate XXX). The wound is then repaired, paying particular attention to the approximation of Buck's fascia (Colles' fascia is known in the United States of America as Buck's fascia)

Burns of the Male Gentalia and Perineum.—A C. Drummond<sup>6</sup> recommends sulphonamide outment applied as a pressure dressing Œdema of the meatus and foreskin is always pronounced, and before resorting to catheterization, magnesium sulphate fomentations should be applied to the glans penis

Avulsion of the Penile and Scrotal Skin.—L T Byars describes the technique of plastic repair Ample free-thickness grafts are effective when their technique is followed

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PERITONITIS. (See Intraperitoneal Chemotherapy)

#### PERTUSSIS.

Thomas Anderson, M.D., F.R.C.P.Ed

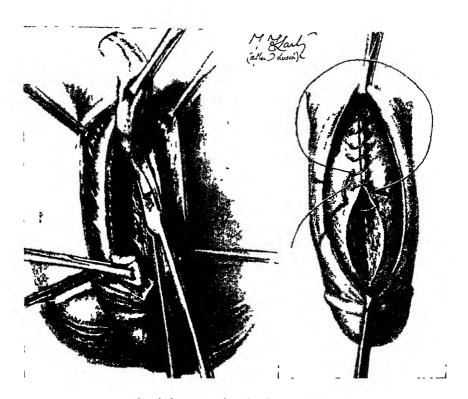
Epidemiology.—The number of notifications of pertussis in England and Wales during 1943 was 96,186 <sup>1</sup> This was an increase on the figure for 1942 (66,616), but remained below the total recorded in 1941 (178,330). Deaths during the year numbered 1114, the mortality-rate per hundred notifications was thus 1 3, while the corresponding rates for 1942 and 1941 were 1.2 and 1 1

Diagnosis.—R Cruckshank, drawing attention to the seriousness of this disease as a cause of loss of child life, pleads for the use of the name "pertussis"

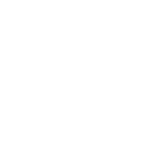
# PLATE XXX

# INDURATIO PENIS PLASTICA

(HAMILTON BAILLY)



Lowsley's operation for induratio penis plustica



instead of "whooping-cough" The latter term, by emphasizing a clinical characteristic which only appears late in the disease, induces the tendency to await its appearance before making a diagnosis If there is to be any improvement in the heavy mortality which it induces in the first year of life means must be sought to hasten diagnosis before the paroxysmal stage is reached. The white-cell count in the catarrhal stage may be helpful, for there is nearly always a leucocytosis with a relative lymphocytosis of 60-80 per cent. Such a method of diagnosis, however, is not absolute, and some means of isolating the causative organism at an early stage is worthy of intensive study cough-plate has been advocated for this purpose, but has not been adopted generally, and indeed it is a procedure not easily carried out by the practi-A B Donald, however, was able to show that the cough-plate could give reliable information, and that the highest proportion of positive results was obtained in the first three weeks of the illness. The recent work which has resulted in the production of stable penicillin along with the knowledge that H. pertussis was resistant to its action has prompted R Cruickshank4 to use a penicillin-covered plate of Bordet-Gengou medium which is inoculated from a swab taken from the suspect's posterior nasopharynx Two points of some importance emerge First, the use of penicillin on the plate resulted in unusually heavy growths which could not be obtained on plain Bordet-Gengou Penicillin is thus essential for success The second point is of great practical importance to the practitioner Provided they were kept moist, swabs which lay on the bench overnight and others which were sent through the post still gave positive results These results certainly bear promise of a useful method of diagnosis, a method, moreover, which is the more likely to be positive the earlier in the disease it is conducted

Intradermal Test for Susceptibility.—E W Flosdorf and his colleagues<sup>5</sup> have extended their tests of a toxin-free H pertussis agglutingen as a method of determining susceptibility by means of allergic skin reactions The agglutinogen, which is supplied in the dried state, is reconstituted with normal saline immediately before use, 01 cc (containing 10 units) is injected intradermally. A positive reaction (indicating immunity) may be immediate and wheal-like, or be delayed for twenty-hours and show a result similar to the tuberculin Readings were therefore made at half an hour, and at twenty-four hours. Induration, not erythema, was the determinant factor in a positive (a) Positive—a well-indurated reaction Three results were read 20 mm. or more at either half an hour or twenty-four hours, (b) Weakly positive-an indurated reaction not exceeding 20 mm but at least 10 mm, and (c) Negative—no induration beyond an area of 10 mm

The test was applied to four groups, with the following results —

1	Infants 6-14 months with no history of dis-				
	ease or vaccination	99	per	cent	negative
2	Older children—history unknown	24	,,	,,	,,
		77			

3 Children—history of past pertussis 11 " 74 ,, 4 Children—vaccinated against pertussis

[The infants who comprise the first group are likely to have reliable histories, for subclinical or undiagnosed pertussis is unusual at this age —T A ] Further, in 173 of the children agglutination titres were determined before skin testing. All those with titres of 1 20 or higher gave positive or weak positive skin reactions. The test, however, was also positive in some who had circulating antibodies, and the authors conclude that the test presumably detects 'fixed' antibody Finally, tests of agglutination titres were carried out on the same patients after the skin test, when it was found that there had been a marked rise in the titre in those who showed a positive result, in some cases by as much as from zero to 1 10,000. In all cases who were tested ten months later this rise in antibodies was found to have persisted. The test was used in an institutional epidemic and was found to predict susceptibility accurately Repeated injections of the agglutinogen may produce a significant level of antibodies and so induce immunity

Vaccination in a Residential Nursery.—A M McFarlan and E Topley's record the story of a trial of vaccination in half of the 24 inhabitants of a residential nursery in England The two groups were equalized in regard to age, and one group was given two injections of 20,000 million organisms, separated by an interval of four weeks. Four months later pertussis broke out in the home and attacked all 24 children in complete disregard of the vaccinal status. The authors could observe no difference between the control and the vaccinated group either in the incubation periods or in the severity and duration of the disease

Serotherapy of Pertussis.—J P Beaudet? had an opportunity of using an antitoxin in 100 cases of whooping-cough (12 under one year and 21 between one and five years) The antitoxin is prepared by vaccinating rabbits with a mixture of pertussis vaccine and toxoid. The dosage of the serium was 10 c c (10,000 units), which was injected intramuscularly. There was little or no local or general reaction. Of those who received antitoxin within a week of the start of the paroxysmal stage, 58 per cent recovered within 15 days and another 26 per cent within a month. The serium was also used prophylactically in 5 cases, 3 of whom did not develop pertussis. The author realizes how difficult it is to evaluate the treatment, but feels that as there were no deaths (and 12 of the cases were infants) and few complications, the results justify further study.

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#### PHARMACOLOGY AND THERAPEUTICS.

R St A Heathcote, DM, FRCP.

The Prevention of Seasickness.—Of travel on the sea, it has been said "for the first day you are afraid the ship is going down, but for the next two you are afraid that it isn't". While to the fortunate immune this may appear a somewhat exaggerated view, there is little doubt that to a large number, especially among women, seasickness is a source of great distress, though fortunately rarely only of danger. To the unhappy susceptible it is no source of comfort to hear the oft-told tale that the great Lord Nelson himself was invariably seasick at the commencement of a cruise. He, or she, would infinitely prefer to take some drug, however unpleasant it might be, if it would prevent the following of that classic example

For this condition many drugs have been recommended in the past, falling generally into one of two categories, the depressants of the central nervous system, and the belladonna group. Of the former, chloretone and the bromides, with, more recently, the barbitones, have been the most popular. Among the latter, atropine has been employed fairly widely, while, among related substances, many practitioners will remember with joy the delightful Bateman drawing which accompanied the advertisements of Navigan.

Recently, there has appeared (Holling, McArdle, and Trotter¹) a very interesting account of experiments performed on soldiers, under the aegis of the M.R.C., doubtless in preparation for certain noteworthy occurrences of last June. It was desired to find out what drugs could be used to ensure that troops, landing from the sea, should not be incapacitated from fighting as a result of

their experiences on it Tests were made of a number of drugs, and, having regard to the inherent difficulties of the experiment, they were subjected to conditions of control which were at least as good as could reasonably be expected. The results showed that, while some degree of protection could be obtained by the use of phenobarbitone, the only really effective drugs were the alkaloids of the belladonna group Of these, hyoscine appeared to be considerably better than either atropine or l-hyoscyamine An oral dose of the former of the gr (0 6 mg) gave protection to a significantly higher proportion of susceptible persons than did  $\frac{1}{50}$  gr (10 mg) of the others, and with  $\frac{1}{50}$  gr (12 mg) threequarters of the susceptibles were protected. The only noticeable side-effect was a certain degree of dryness of the mouth, no results being observed either on the eye or the brain These experiments were carried out on young fit men, and the authors make it clear that the results cannot be applied directly to the very young or very old of either sex, or to women in general Again, it was not possible to determine whether hyoscine (or atropine) would prove useful on long voyages, as the duration of these experiments was only about 5 hours

It has been generally accepted that seasickness arises from disturbances in the labyrinth, either the semicircular canals or the utricle being held responsible (Martland et al 2) It is also generally agreed that sea-, air-, car-, and trainsickness all arise in the same way from the labyrinth So far as the last two forms are concerned, the present writer is doubtful as to the validity in all cases of this allocation of blame. Several years ago, he had a puppy, now, alas, dead, which was invariably sick, and that within two or three miles, only if he travelled on the seat of the car If, however, he was placed on the floor at the back, where the motion would probably be at least as great, he did not vomit even in a three-hour journey This observation was made not once only but on several occasions One obvious difference between the two forms of travel was that in the one case he could, and in the other he could not, see out of the car, and it is the writer's submission that the vomiting was due, reflexly, to the rapid movements of the eyes in trying to follow objects passed by the car In the case of travel by air or by sea, such conditions do not arise. A contributory cause in air-sickness may be the effect of high altitudes in the nature of mountain-sickness, which may be expected to affect some persons at lower altitudes than others. Apart from this, however, sea- and air-sickness are probably due to reflexes arising from the labyrinth

The physiology and pharmacology of nausea arising from movements such as occur on the sea have been comparatively little examined. Wolf<sup>3</sup> investigated, in a subject with a gastric fistula and in normal men, the effects of swinging. He found that the first noticeable change was a diminution in the movements of the stomach musculature. Administration of physostigmine, with its parasympathomimetic action, prevented nausea arising from vestibular stimulation, On the other hand, it has been observed (Holling et al <sup>1</sup>) that, although swinging may reproduce in a proportion of subjects the symptoms of seasickness, it was not possible to predict exactly from such experiments which of the subjects would, in fact, be sick at sea. That the solanaceous alkaloids in relatively large amounts antagonize parasympathetic effects is true, but there is recent evidence (Anderson and Morris<sup>4</sup>) that, in small doses, atropine may stimulate the gastric muscle in man

The present writer, himself happily immune to the effects of the sea, has no personal knowledge on this subject. He has, however, often recommended persons susceptible to the sea to take bromides in small amounts, commencing a day or so before the date of the voyage. In many cases this seems to have been effective, but there is, of course, no control of the evidence. It is perhaps

a pity that bromides were not tested in these recent experiments, but evidently from the description the conditions were not suitable for their employment

There seem to be at least two different categories, from the point of view of the sufferer, of sea voyage the short—e.g., cross-channel—trip, generally in a small and lively ship and often in shallow, extremely tidal waters where a short, irregular sea is to be expected, and the long voyage, generally in a large, less lively ship, in open waters, where the seas may be very high, but are much more regular. Again, in the smaller ships, there are many factors which militate against the somewhat susceptible person escaping, e.g., the smell of hot oil from the engine-room, the sight and sounds of other sufferers, and, not least, the intensely nauseating odour of stale vomit, from which many of these ships seem never free. The problem of prevention of seasickness would seem much greater in the smaller, than in the bigger, ships

Haslam, in a letter to *The Lancet*, from experience with many sufferers, advises  $\frac{1}{100}$  gr of hyoscine hydrobromide to be taken once before sailing and then three times daily for, as a rule, not more than three days. This would seem admirable for the bigger ships, for which, in fact, it would appear intended, but scarcely adequate for short journeys. Here, one might well administer  $\frac{1}{100}$  gr an hour or two before starting and  $\frac{1}{100}$  gr after three hours. If the journey were more prolonged, the latter dose could be repeated six-hourly thereafter.

There are some persons in whom the cause of seasickness is very largely, if not entirely, psychological in origin. It is doubtful if any medication, short of producing unconsciousness before the journey starts or even before the person goes on board and maintaining it to the end, would be successful Possibly, in such cases, strong psychological suggestion might be of value, but the present writer knows nothing of this having been tried

The Treatment of Urinary Retention due to Causes other than Mechanical Obstruction.—After extensive intrapelvic operations, such as excision of the rectum for carcinoma, a common sequela is atony of the bladder wall, which may or may not be permanent. This is probably due to actual trauma of the parasympathetic nerves supplying the organ, which are motor to the fundus and inhibitor to the trigone. Again, after surgical operations in areas far removed from the bladder, a similar, but only temporary, condition may occur, possibly reflex in origin or perhaps due to the effects of the anæsthetic, more especially if spinal anæsthesia has been used. Further, the condition is not uncommon in certain diseases of the central nervous system, in which case it is likely to be permanent. In all these cases there may be complete inability to void urine spontaneously, or the weakness of the muscular contractions of the organ may be such that, after voiding, there is a large volume of residual urine left in the bladder.

In such cases, either catheterization for a longer or shorter period will be needed or some drug must be employed which will so act as to cause the bladder muscle to contract more strongly. If the condition arises after surgery with no trauma to the vesical nerve-supply, it will probably clear up spontaneously after a few days, but the use of a drug may remove all necessity for catheterization. After intrapelvic surgery, however, the damage to the vesical nerves and to the tissues in the neighbourhood of the bladder will be such as to render catheterization, for a period at least, obligatory. It is most desirable that at the end of this stage the normal reflex mechanism should be re-established if possible, and the administration of a potent drug will probably increase the chance of this occurring. Should this fail to come about, however, the use of the drug can still take the place of that of the catheter, to the considerable

relief of the patient. In the cases of nervous disease, the condition is generally permanent and the administration of the drug will need to be continued for life.

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In selecting a drug for this purpose, the choice will largely depend on its site of action. The more peripheral is its point of attack, the more generally useful will it be. As the nerve-supply is parasympathetic, some cholinergic drug is evidently desirable, as its effect will be exerted on the specialized receptors on the smooth muscle-fibres themselves. Many such drugs are known, and two, pilocarpine and carbachol, are official

Physostigmine and prostigmine have a similar end-result, but act only indirectly by inhibiting the action of choline-esterase which destroys acetylcholine, the humoral transmitter of the nerve impulse. These drugs can only exert their action, therefore, if a nerve impulse can reach the end-plate and so give rise to acetylcholine, and they have no effect if the nerve, and with it the end-plate, is completely degenerated.

In general, the usefulness of these drugs is much limited by their low degree of selectivity, so that they affect all organs with cholinergic nerve-supply more or less equally. This may give rise to unpleasant or even serious side-actions. Thus, pilocarpine, in addition to stimulating the vesical musculature, affects strongly that of the intestine and, less, that of the bronchi. It also causes great activity in the salivary, sweat, and bronchial glands. In over-large dosage it has caused pulmonary edema. Again, the majority of the choline derivatives either have too brief a period of activity, or possess, in addition to the true parasympathetic "muscarine-like" action, the properties of nicotine. They may even suffer from both of these disadvantages.

Search has therefore been made for substances which do not produce these undesirable effects, i.e., which show a relatively high degree of selectivity for certain organs, and which possess none of the nicotine-like actions. Most-of the substances prepared so far are derived, ultimately, from trimethylamine,  $N \equiv (CH_3)_3$ , in the form of quaternary ammonium compounds. The simplest of these, tetramethylammonium iodide, was shown by Burn and Dale's to possess both the muscarine-like and the nicotine-like actions. Trimethylethylammonium iodide they also found to possess these actions, but to be only about one-half as powerful. Choline chloride, trimethyl-2-hydroxy-ethylammonium chloride, also shows the two different kinds of action, as does acetylcholine but at a much higher degree of intensity

Two derivatives of choline, carbaminoyl-choline chloride or carbachol, and acetyl- $\beta$ -methyl-choline chloride or mecholyl, have found use in medicine in late years. Of these, the former has the advantage of being only slowly destroyed in the body, with a consequently prolonged action, but the disadvantage of possessing well-marked nicotine-like actions. The latter, on the other hand, possesses an almost pure muscarine-like action, but suffers from the disadvantage of being rapidly destroyed, though not so rapidly as acetylcholine. Some years ago, the  $\beta$ -methyl derivative of carbachol was prepared. Laboratory tests showed it to have a strong action

on the intestine with little effect on the circulation (Simonart<sup>7</sup>; Farber<sup>8</sup> Molitor<sup>9</sup>, Youmans and Waisman<sup>10</sup>) Clinically, it was found effective (Starr and Ferguson<sup>11</sup>) in cases of urinary retention especially. The present writer has seen no further accounts of its use, and, so far as he knows, it is not on the market. Whether this is due to difficulties in preparation or to its having been found on further examination to be less useful than had been thought, he has no knowledge

From time to time, many other choline derivatives, chiefly esters and ethers, have been investigated in the laboratory but have not been thought worthy of clinical trial for a variety of reasons-lack of efficiency, shortness of action, toxicity, etc A new series of compounds was first examined by Fellows and Livingstone 12-14 These may be regarded as tetramethyl- and trimethylethylammonium salts in which a hydrogen atom of one of the methyl groups has been replaced by a furyl or tetrahydrofuryl ring Other compounds in which one of the methyl groups of tetramethylammonium iodide was replaced by a propyl, butyl, or amyl group were also investigated With both the furyl and tetrahydrofuryl compounds of tetramethyl- and trimethylethyl-ammonium iodide, an almost pure muscarine-like action was obtained—fall of blood-pressure, inhibition of the heart, salivation, increased tone of the intestinal and vesical musculature, etc., all these effects being readily antagonized by atropine. Of all the many compounds tested, the most powerful, judged by its minimal effective dose, and the most probably useful, judged by the relation between this and the average fatal dose (L D  $_{50}$ ), proved to be furfuryltrimethylammonium iodide, since introduced into medicine as furmethide

$$\begin{array}{c|c} H_3C & \parallel & \parallel \\ H_3C - N & \parallel & \parallel \\ H_3C - N & CH_3 - C & CH \\ & & & \\ H_3C & & & \\ \end{array}$$

Furfuryltrimethylammonium iodide (Furmethide)

$$\begin{array}{c|c} H_3C & \parallel & \parallel \\ H_3C & \parallel & \parallel \\ CH_2C-N & CH \\ H_3C & H_3C \end{array}$$

Furfuryldimethylethylammonium iodide

$$\begin{array}{c|c} \mathbf{H_3C} & \mathbf{H_2C-CH_2} \\ \mathbf{H_3C-N} & \mathbf{CH_2-HC} & \mathbf{CH_2} \\ \mathbf{H_3C-N} & \mathbf{I} & \mathbf{O} \\ \mathbf{H_4C} & \mathbf{O} \end{array}$$

Tetrahydrofurfuryltrimethylammonium iodide

$$\begin{array}{c|c} H_sC & H & H \\ H_sC & CH_{s^---}C & CH \\ H_sC & H & H \end{array}$$

Benzyltrimethylammonium iodide

The clinical usefulness of acetylcholine, and to a lesser degree of mecholyl, is limited by its rapid destruction by choline-esterase While, on the one hand, an aqueous solution of furmethide, even after exposure to light, preserved its activity for a year or more, on the other hand, the action of small doses on the blood-pressure was found to be merely transient and could be repeated at short intervals of time. This suggested that furmethide, while stable in water, is rapidly destroyed in the blood-stream, which if true would limit its possible usefulness The matter was therefore put to direct test by mixing with blood known amounts of furmethide and of mecholyl, in proportion to their respective minimal effective doses, as judged by action on the blood-pressure From time to time, a volume of the mixture which originally contained one minimal effective dose was injected into an animal, and the change, if any, in the bloodpressure noted It was found that mecholyl, after the lapse of 12 minutes, was no longer effective, but that furmethide still produced its normal action after more than 3 hours The much greater stability in blood, thus demonstrated, of furmethide is attributed, and almost certainly rightly, to the absence in its composition of an ester linkage, and therefore to the inability of cholineesterase to destroy it

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The same authors in a later paper 15 showed that similar compounds, in which the furyl was replaced by a phenyl ring, produced similar but much weaker muscarine-like, but somewhat stronger microtine-like, effects. It does not seem likely that these compounds will be of value in medicine

The action of furmethide on man was first studied by Myerson and his colleagues. 16 On the whole, it resembled very closely that of mecholyl, but with only about one-fourth the intensity of the latter. On the other hand, furmethide is active when given by mouth while mecholyl is not. The only pronounced side-action noticed was sweating, which was often well marked and sometimes caused a fall of one to two degrees in the body temperature. Though the pulse-rate was regularly increased by doses such as 1 mg given subcutaneously, the blood-pressure showed but little fall with five times that dose. The tone of both the bladder and the intestine was frequently found to be considerably increased.

Bondy and Altschule17 re-examined the effects of furmethide on man, directing their attention more particularly to those on the cardiovascular system After parenteral, but not after oral, administration, a transient fall of blood-pressure with tachycardia and a rise of venous pressure occurs These effects are, however, only of very minor importance The more notable side-actions were flushing, sweating, and urgency of micturition In the dosage found suitable for treatment of atony of the bladder, no reactions are to be expected which will cause discomfort, but care is needed to protect patients against excessive heat loss after the drug. Repetition of the dose, even after a relatively short time, was without ill effects. Two papers, by Lipton, Beaser, and Altschule<sup>18,19</sup>, dealing with its medicinal use in cases of atony of the bladder with urmary retention, have since appeared In view of the observations referred to above, 16,17 that furmethide acts strongly on the bladder, with little effect on the circulation, it was given a trial in a number of patients suffering from a variety of conditions. The absence of action on the circulation was confirmed, but much less effect on the intestine was observed than was reported by Myerson The cases of urmary retention described are divided into three classes those in whom it followed operations remote from the bladder, those in whom trauma to the bladder or its nerves had occurred, and those due to diseases of the central nervous system. Six out of eight in the first class had the bladder function restored after one or two doses. In the second class, 18 out of 15 responded well to the drug, as did 7 out of 8 in the third. The dosage employed was 3-5 mg for subcutaneous and, generally, 20 mg. for oral administration. Even 10 mg subcutaneously or 30 mg orally produced no ill effects. In several cases, previous administration of carbachol had proved ineffective in restoring bladder function.

While furmethide may be expected in the great majority of cases to cause an increase in tone of the vesical muscle and so to reduce the volume of residual urine, it cannot be hoped that, after really severe damage to the peripheral or central nervous control, the normal reflex reactions will be restored. It is to be feared that there will be many cases of war injury which will fall into this category. The use of furmethide, with probably some manipulation of the bladder, should prove most useful in a great proportion of these, by freeing them from the necessity of regular catheterization, with its inevitable dangers. It should, however, be noted that obstruction of the neck of the bladder is a complete contra-indication to the use of the drug.

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PITUITARY GLAND. Sir Walter Langdon-Brown, M.D., D.Sc., F.R.C.P. Samuel Leonard Simpson, M.A., M.D., M.R.C.P.

Cushing's Syndrome.—An excellent paper by R Luft1 presents a full review of the literature and extensive clinical studies of this syndrome in relation to hirsutism and precocious puberty, but the most important aspect is the systematic work on the assays of different hormones in the urine, and their correlation with the clinical and, where possible, pathological condition. The term 'hirsutism' is used to denote the adrenogenital syndrome, and especially those types in which hairiness of male type is a marked feature. Where exploration was undertaken, the adrenals showed cortical hyperplasia, and in only one case was a cortical adenoma, of walnut size, found. In all these cases, the gonadotrophins in the urine were below normal, or perhaps normal, but not above normal The average cestrin excretion was low, 24 IU., compared with normals of 50 to 80 IU The andrin excretion was high, 24 mg. to 38 mg per day, compared with the normal of 15 mg as determined calorimetrically, but biological assay showed even higher values, 50 to 105 IU, compared with normals of 20 to 40 I U In Cushing's syndrome, the gonadotrophins were also in concentrations below normal values, even in those cases which showed the basophilism changes of Crooke and Mellgren, and in one case of basophil adenoma, which biological finding, if correct, tends to cast doubt on the basophil cells as a source of gonadotrophic hormone, although the problem is a complicated one. The andrins were moderately increased, both when photometrically assayed, 26 mg per day, and biologically assayed, 38 IU. (the latter in contrast to the higher values in the adrenogenital syndrome-see above). The cestrogens were below normal, normal, or slightly There were no large increases in cestrogen values, but in no case was an adrenal neoplasm present The hypophysis was examined in 4 cases, and in addition to one basophil adenoma all four showed basophil cells with hyalinization and degranulation of cytoplasm (Crooke's cells), and also pathological cells, with cloudy vacuolated cytoplasm with blurred cell borders and a polymorphous, polychromatic nucleus, often with a large, acidophil nucleolus (Mellgren, 1942). Of the two cases of precocious puberty, the first was a boy of 7 with an adrenal carcinoma, large penis, and small testes, and with Crooke's cells in the pituitary The second was a boy of 21 years, with a large penis,

and testes developed as a boy of 6, with a normal sella turcica, a right adrenal smaller than normal, and a left adrenal twice its size. The first case showed several features of Cushing's syndrome, and the second approximated to the infant Hercules type. The andrins were enormously increased in the first case, 141 5 mg per day, and considerably increased in the second, 39 mg, compared with a normal of 2 mg. The gonadotrophins were below normal concentrations, which is perhaps surprising in the second case, which might have been of primary pituitary origin, with secondary adrenal hyperplasia. Œstrogens were not determined

In hirsutism, although the author could not confirm the adrenal cortex ponceau-fuchsin stain of Broster and Vines, he does confirm the claim of Broster that unilateral adrenalectomy produces amelioration of the condition, although the symptoms recurred after some months. In the second ease of precoccous puberty also, exision of a large part of the hyperplastic adrenal gland brought about a temporary cessation of the precocious sexual development. In Cushing's syndrome, deep radiation of the pituitary gland produced considerable improvement in some cases.

Therapeutic Observations in Cushing's Syndrome.-W. H. Perloff, E Rose, and F W Sunderman<sup>2</sup> report some observations on the treatment of a woman of 30 with four years' history of amenorrhoea, adiposity, hypertension, hirsutism, ecchymoses, diabetes requiring insulin, and, more recently, very severe pains Radiographs of the skeleton showed marked demineralization, in the back involving the skull and parts of the cervical, thoracic, and lumbar portions of the spine, the pelvis, and ribs, also old fractures of several ribs and of several thoracic and lumbar vertebræ, and fractures of the pubic and ischial rami were As in other cases, the serum calcium and phosphorus were normal, but there was a negative calcium balance on a low calcium diet favourably influenced by large doses of vitamin D Prolonged therapy with testosterone produced increase in strength, improvement in the backache, and amelioration of the diabetes, but adversely resulted in increased hirsutism It also produced increased retention of nitrogen Multiple renal calculi before treatment might have no appreciable benefit been due to increased calcium excretion Irradiation of the pituitary gland, before the current investigation, had produced no benefit

On the whole, one is not able to conclude from this paper that any fundamental benefit had been produced from any form of therapy employed. In general, in the absence of an adrenal tumour, which can be removed, therapy of the condition is difficult, but good results have been recorded both from deep irradiation of the pituitary gland, or, where this has failed, by the insertion of radon seeds in the pituitary gland by open operation. As to the demineralization of the bones in Cushing's syndrome, the process appears to be more complicated than that which might be due to secondary hyperplasia of the parathyroid glands, and no adequate explanation has yet been forthcoming

Simmonds's Disease.—T Jersild and K Iverson's describe three fairly characteristic examples of Simmonds's disease in women of 66, 52, and 50 years of age, with history of onset after heavy parturition bleeding, as long ago as 23, 18, and 31 years respectively. The first died from bronchopneumonia, and showed atrophy of the anterior lobe of the pituitary, and the adrenal cortex and ovaries. The latter two were treated with injections of gonadotrophic hormone over a period of several months, and although some slight general improvement is claimed by the authors, no specific sexual or other effects were observed.

Diabetes Insipidus.—W G Wyllie<sup>4</sup> recorded 5 cases in children under 14 years of age, all of whom responded to a daily intramuscular injection of 0.5

c.c. of pitressin tannate (5 units per c c) Case 1 was a boy of 8 years with a third-ventricle tumour in the region of the pineal gland, and associated with sexual precocity, Case 2, a boy of 8 years, also with a third-ventricle tumour, but with no genital changes, Case 3, a boy of 7, in whom symptoms followed fracture of the skull, Case 4, a boy of 6, with idiopathic diabetes insipidus, Case 5, a boy of 13, in whom symptoms appeared to follow pertussis at the age of 6. In four of the six cases in which the sodium chloride concentration test was used, an abnormally low hourly percentage of NaCl confirmed the diagnosis of diabetes insipidus

F E Harding<sup>5</sup> treated a series of 8 patients by this drug, 4 of whom were pregnant. Three of the cases were hereditary, in one family five members being affected, and two patients were identical twins. One case was associated with encephalitis following measles. Injections of pitressin tannate in oil were found to have every advantage over simple aqueous pitressin, 5-unit ampoules of the former being more effective than 20 units of the latter, and the effect lasting for 48 hours compared with 6 hours. Undesirable side effects, such as pallor, palpitations, bowel cramps, and nervousness, frequently found with aqueous pitressin, were absent or minimal with pitressin tannate in oil. These observations are confirmed by the experience of many others.

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PNEUMONIA, PRIMARY ATYPICAL (See PRIMARY ATYPICAI PNEUMONIA)

#### POLIOMYELITIS: THE KENNY TREATMENT.

Macdonald Critchley, M D, F R C P

Those of us in this country and in Australia with experience of the natural behaviour of poliomyelitis, have noted with some pain the enthusiasm which the "Kenny treatment" has been accorded in the United States This technique was given a serious trial both in Australia and in Great Britain That no extravagant claims to 'cure' the disease could be justified seemed clear from the careful reports issued by the investigating bodies 1,2

Since then, Sister Kenny has found in North America a measure of support which elsewhere seemed scarcely justified. It is possible that she has modified her doctrines within the last year or two, especially in so far as they deal with the nature and morbid physiology of the disease. In fairness, it may possibly be averred that the extravagances of the lay press and radio may have done the system an injustice by claiming an incredible superiority in her endresults.

Most scientific observers believe that poliomyelitis is a self-limited affection, that no regime of treatment is known which will effect a 'cure', that the paralysis is due to an irreversible decay of anterior horn cells in the spinal cord; that the difference between 'good' and 'bad' management of a case consists in the adequacy with which rehabilitation is carried out, deformities avoided, peripheral vascular changes overcome, and trick movements substituted for muscles which are devoid of function. No doubt certain defects have been committed in the past in the management of poliomyelitic patients, but it is not justifiable to regard as either 'modern' or 'orthodox' such measures as electrical stimulation, prolonged immobilization, unduly heavy or cumbersome splints and apparatus. Such misplaced activities merely serve as targets for attack by such critics as the Kenny school. Nor is there any excuse for a system of studied neglect in the handling of a case of poliomyelitis.

What, then, are the points which underlie the Kenny system—other than a mere criticism of what she terms "orthodox treatment"? The features

include a hypothesis as to the nature of the disease, and a means of combating the disability

According to J F Pohl, the true symptoms of pohomyelitis had never been recognized until Miss Kenny discovered them, these symptoms being muscle spasm, inco-ordination, and mental alienation The alleged "muscle spasm" has been discussed by H Kabot and M E Knapp,4 who built around this idea a physiological speculation and a suggestion that prostigmine should be used in this disease J Moldaver, susing electro-myographic methods and measurements of chronaxy, could find no justification for the mythopathology taught by the Kenny school Nor did the electro-technical work of A Watkins, M A B Brazier, and R S Schwobs, substantiate two of the props of the Kenny triad, a disorder of reciprocal innervation was demonstrated, corresponding with Kenny's "inco-ordination", but as these authors point out, this is a non-specific finding which may not necessarily indicate central nervous dysfunction As S Cobbs wrote when discussing this subject, "thus it is being demonstrated once more in the history of medicine that new and empiric methods of treatment, backed by uncritical enthusiasm, may produce many cures but much physiologic nonsense"

But are the results of the Kenny methods actually superior to other forms of treatment? Some, such as W J Stewart, would say they are Others would deny the claim. Thus J A. Key has ably reviewed the present position in his article entitled "Reasons why the Orthodox is better than the Kenny Treatment of Poliomyelitis." Analysing these alleged cardinal features, Key says there is nothing unfamiliar in the occurrence of tenderness, stiffness, and rigidity or early contracture of muscles, which one usually ascenbes to spinal and meningeal inflammation. Miss Kenny apparently regards the spasm as being due to some inflammatory or other disease condition of the muscles themselves. The use of the terms "inco-ordination" and "mental alienation" as applied by Miss Kenny to the pathophysiology of poliomyelitis is open to serious criticism.

The Kenny treatment, as described by Key, starts in the acute febrile stage, as soon as the diagnosis is made. Hot packs are applied to the trunk and limbs for a period of 12 hours each day. The packs are renewed generally once an hour, though sometimes as often as every 15 minutes and at other times every 2 hours. The patient is kept flat in bed, with the feet supported by a board "to stimulate the normal standing reflex." Meantime the joints are moved daily, the patient is taught to exercise his muscles, and an attempt is made to re-educate the paralysed muscles. No massage is given. The patient is made aware of the individual muscle that is to be exercised and is taught its insertion; he is then exhorted to try and approximate the insertion to the origin of the muscle, rather than to carry out a specific movement.

Hot packs, rest in bed, and muscle re-education are continued for as long as muscle tenderness or spasm continues. Muscle examination and tests of muscle power are prohibited. No record is kept as to which muscles are paralysed and which are not, though records may be kept as to which ones are spastic and tender.

Key puts forward in his article twenty-eight reasons why the orthodox treatment is superior to the Kenny method. These may be summarized.—

1 Constant handling during the acute, febrile phase will tend to disturb or fatigue such a patient and possibly to weaken his resistance. [This criticism recalls the axiom of scientific medicine as to the necessity for rest in the presence of pain and inflammation. Whether stimulation of cutaneous areas (exteroceptive impulses) or passive movement of the limb (proprioceptive

impulses) can affect—and affect adversely—acutely inflamed anterior horn cells within the same spinal segment, must remain a matter of opinion—M C]

2 Refusal by Kenny advocates to use a respirator in cases of acute respiratory paralysis may prove fatal

3 There is no evidence that the Kenny treatment either prevents or decreases the extent of the paralysis

4 Early active movements probably prolong the stage of muscle pain and tenderness [This point also raises the question as to whether inflamed anterior horn cells are adversely affected by frequent efferent impulses impinging upon them from the descending pyramidal pathways—M C]

5 Patients who are immobilized for months in the normal standing position are apt to show severe stiffness of the spine and tightness of the hamstring and quadriceps muscles

6 Immobilization flat, until all spasm goes, entails unduly long confinement in bed.

7 Painful tender muscles are relieved quicker when immobilized in a well-fitting splint or cast, and deformities are thereby better prevented.

8 Orthopædic surgeons use hot packs where necessary, but not as a routine measure, not for long periods, and not during the stage of fever

9 Early deformities are prevented more easily and more effectively by orthodox measures

10. Late deformities are not catered for under the Kenny regime, the belief that such do not occur in patients treated by Kenny methods has yet to be scientifically substantiated.

11 'Trick' and 'mass' movements are treated better by orthodox methods

12 Advocates of the Kenny method consider that paralysis occurs only very rarely in the disease, and paralysed muscles are regarded by them as "alienated"

13 Orthodox measures recognize and treat paralyses, whether total or partial, persistent or fleeting

14 The Kenny disciples ignore the power present in a muscle, believing that if a muscle can contract at all it is normal, though "partially ahenated".

15 Muscle examination is forbidden under the Kenny régime, and no records are kept of the condition of the muscles [Scientific proof of the claims can scarcely be hoped for in the circumstances—M C]

16 Under orthodox treatment, contracted muscles which are immobilized tend to relax spontaneously, and do not assume the important role which Miss Kenny would assign to them

 $17\,$  Both burns and furuncles have been seen to follow the hot packs of the Kenny practitioners

18. Orthodox treatment aims at relieving the same conditions as the Kenny method, two of which Miss Kenny has renamed and claims to have discovered —" mental alienation" and "inco-ordination"

19 Kenny measures do not protect paralysed muscles from being stretched [e g., the arm is allowed to hang by the side when the deltoid is paralysed.—M. C ]

20 Paralysed patients have been observed, maintained by the Kenny school in the standing position for six months or more. It is believed that orthodox management would have produced much less stiffness of the back and thighs and no more paralysis—if as much

21 In the Kenny treatment patients are buoyed up by extravagant promises of complete cure.

22. Lack of splints handicaps those who could thereby be afforded more effective use of their paralysed limbs

- 28 All the Kenny 'cures' witnessed by Key were in non-paralytic patients who have never required any treatment at all.
- 24 Followers of Miss Kenny do not recognize spontaneous recovery, but give all the credit to her method
- 25 Treatment of the paralysed muscles (which cause the subsequent crippling deformities) plays a minor role in the Kenny methods
  - 26 The Kenny method is expensive in material and in man-power
- 27 The Kenny method is rigid, it requires special equipment, it is difficult to apply in epidemic conditions
- 28 Lay press and radio have misled the public by claiming 80 per cent cures under the Kenny régime, as opposed to an average of 12 per cent under orthodox management
- J. A Key quotes, with reference to this last point, the results of the recent epidemics in which orthodox treatment was used. In Alberta in 1941, R. G. Hucknell<sup>11</sup> found a return to normal (or practically normal) of 82 2 per cent of 167 patients. Of 120 patients personally followed up in the Alabama epidemic of 1941, H. E. Conwell<sup>12</sup> found over 80 per cent were normal or almost so. R. E. Lenhard<sup>13</sup> examined 289 survivors of the Baltimore (1941) epidemic 68 per cent had recovered; 14 per cent had a slight residual paralysis, 11 per cent had moderate and 5 per cent marked palsies; and 2 per cent were wheelchair patients. (Of the original 296 patients affected 9 died.)

We may conclude by quoting from two sources, giving contrasting viewpoints. In the one, written in August, 1942, F. H. Krusen<sup>14</sup> finishes with these words. "My first impression of Miss Kenny was not too favourable, and I was rather taken aback by her belligerent attitude, and as I told her recently, I was sure that she was a little unbalanced when she spoke of overcoming toedrop in a day or so. But since I have come to know her better, I have learned to admire her, to understand her belligerence, and to applaud her courage. Her ideas are original, and she should be given full credit for having developed a new and extremely interesting concept of the symptoms of early poliomyelitis and the proper management of these symptoms. The Kenny method merits the close scrutiny of every physician."

On the other hand, there is the considered and restrained Editorial in the British Medical Journal, 15 entitled "Fact and Fancy in Poliomyelitis" In the author's words "There can be no doubt that Sister Kenny has brought to her work unusual energy and thoughtfulness, and we may well believe that the young patients who came under her skilful hands received a thoroughness of treatment that, in the Australian bush where Sister Kenny tells us she began her work and developed her theories, was unprecedented"; but later "the entire physiology and pathology of Sister Kenny's 'new concept' uses the terminology, but does not speak the language, of science, and finds its early current parallel in the medicine of Mrs Baker Eddy's world-famous publication, Science and Health"

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#### POLYARTHRITIS, EPIDEMIC. A E. Barnes, M B, F.R.C.P

Epidemic polyarthritis is described by J. H. Halliday and J. P. Horan¹ from an experience of 105 cases among Australian soldiers. Onset is with widespread *joint pains*, the more severe cases also *swelling*. A *rash* is not always present, it may precede the pains by a day, but usually appears on the second or third

day; it lasts 36 hours, is not irritable, spares the face, it is maculo-papilar, with a tendency to pin-point vesiculation which may be mis-diagnosed as chicken-pox, in some cases petechiæ occur in groups on the soles of the feet, there is no desquamation Fever is almost constant, rarely over 101° F, and subsides in two to five days Lymph-glands are always enlarged, but rarely those in the cervical, epitrochlear, or occipital groups, enlargement is moderate, and the consistence rubbery, they are always discrete and freely movable, The tenderness lasts 3-4 days, but the enlargement may persist till after recovery Splenic enlargement is rare. A few show tenderness of the fingertips. The leucocyte count averages 10,000 (limits in 40 cases 5,500-15,000), the differential count is normal. Nothing of significance is found in cultures of blood and from tonsils, nor in the urine. It differs from dengue in having less severe general symptoms—no headache, painful eyes, or severe backache, in having definite enlargement of joints in most cases, and in the absence of leucopenia.

REFERENCE -1Med J Aust 1944, 2, 293

#### POLYPOID LESIONS OF THE COLON IN CHILDREN.

Sir John Fraser, M Ch , F R C S Ed

Simple polypi of the rectum are relatively common in early childhood, microscopical examination reveals the structure of an adenoma, and a malignant change is regarded as an extremely rare event. There are instances in which similar changes have been encountered at a higher level than the rectum, but it has been believed that such developments are infrequent. It appears, however, that this impression must be revised, for, according to R. L. J. Kennedy, C. F. Dixon, and H. M. Weber, the occurrence is more frequent than we realize, and in support of this contention they report their experience of 11 cases encountered in children, the ages of whom varied between three and fourteen years

In the clinical picture one feature is constant—blood in the stool. It is bright red in colour, it covers the surface of the otherwise normal stool, and the amount is generally small. The hæmorrhage may be accompanied by an excess of mucus, other features usually associated with large-intestine lesions, such as pain and diarrhœa, are rare, and the authors draw attention to the importance of this negative in arriving at a diagnosis. The evidence supplied by the bleeding demands further investigation by procto-sigmoidoscopy and by X-ray examination, and the authors offer some interesting comments in respect of both procedures.

Procto-sigmoidoscopy may reveal polypoid lesions in the wall of the rectum or sigmoid colon, but this evidence is incomplete, indeed, in the opinion of the authors, it indicates the necessity of proceeding to a roentgenologic investigation of the entire colon, because of the likelihood that similar tumours exist at a higher level The opinion on roentgenologic examination has great practical value, particularly in respect of the technique implied It is pointed out that since fæcal masses may produce filling defects similar to those exhibited by polypi, all fæcal matter must be removed from the bowel before the roentgenologic examination is begun, and there is an interesting discussion as to the means by which this can be achieved Purgative drugs must be employed, but it is important to choose the proper medium Saline cathartics are rejected because they increase the fluid bulk and lead to undue distension Emollients such as petroleum and vegetable oils are unsatisfactory because they produce insufficient peristalsis, and are too slow in their action. The emodin and resinous cathartics are unsatisfactory because they are unduly erritating, and the same criticism applies to calomel and phenolphthalein

#### PLATE XXXI

# POLYPOID LESIONS OF THE COLON IN CHILDREN

(R L J KENNEDY, C E DIXON AND H M WEBER)

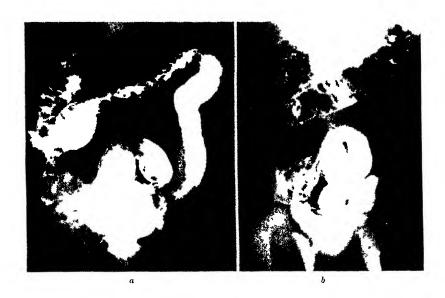


Fig. A—(a) Roentgenogram made after evacuation of the contrast (barium) enema, showing a widening in the transverse limb of the hepatic flexure caused by a large polypoid lesion in this segment (b) "Double contrast" roentgenogram showing the globular polypoid lesion projecting into the lumen of the colon

# PLATE XXXII

# POLYPOID LESIONS OF THE COLON IN CHILDREN—continued (R L J Kennedy, C E Dixon, and II M Weber)

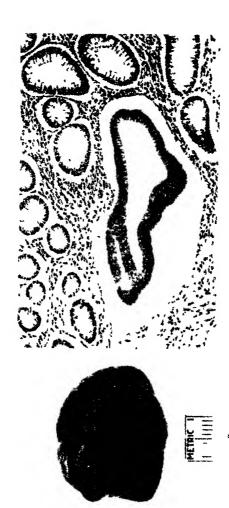


Fig. B—(a) Gross appearance of the polypoid kision of the colon (b) Photonikrigriph of polypoid kision adenocucinom (grade I (x 85))

Plates AVM, VAVII reproduced from Surgery Copiecology and Obstetrics

Castor oil is regarded as the safest and most satisfactory drug, and it is recommended that an adequate dosage is 15 c c for infants and 30 c c for older children. When the X-ray examination is to be done in the morning, the castor oil is administered the evening before, and the evening meal is withheld. The following morning, one hour before the examination is begun, a simple enema (250 c c of normal saline) is given to remove any fæcal residue, and the usual morning meal is given immediately before the investigation commences. The opaque enema is composed of commercial barium sulphate containing a suspension medium, a sufficiency of water is added to give fluidity, and the medium is heated to body temperature. After the barium-filled colon has been studied, evacuation of the enema is permitted, and the bowel is redistended with air or an inert gas, when another series of roentgenograms is taken. By this double control technique detail of great accuracy is obtained, and the position and outline of polypi can be ascertained. (Plate XXXI)

The treatment of polypoid lesions of the colon consists of either transcolonic excision or resection of the involved bowel segment. Assuming that the lesions are few and localized, preference is given to the former, the operation is simple and relatively safe. Colectomy is restricted to cases where the lesions are diffuse, and when this procedure is adopted it is recommended that it be carried out under the two-stage or Mikulicz method

There is particular significance in the reports on the pathology of the tumour (Plate XXXII), of the 11 cases 9 were shown to be adenocarcinomata of a low-grade malignancy, 2 were reported as simple. These are disconcerting figures, one does not anticipate that any proportion of large-intestine polypi occurring in children will show malignant characteristics, and there is the further consideration that the low-grade malignant deposits of childhood will become the frankly malignant lesions of adult life

REFERENCE -1Surg Gynec Obstet 1943, 77, 639

#### PRIMARY ATYPICAL PNEUMONIA.

With the extended experience of recent years a clearer concept of primary atypical pneumonia has emerged. While Bowen¹ is credited with initiating the modern interest in the subject, the weight of evidence indicates that this disease has existed for many years. Numerous instances of patchy pneumonia, unclassified in the past, would now fall into this category. From specimens of lung preserved since the American Civil War (1861–1865) in the U.S. Army Medical Museum, MacCallum² described histologic changes that closely resemble the current picture of primary atypical pneumonia. Contributing to the impression of a recent origin of the disease have been a number of obvious factors—namely, accession in the incidence of unusual respiratory infections, lack of aetiologic definition, mobilization of large groups of young adults for military and industrial service, and the wider application of the refinements of laboratory procedure, particularly roentgenology

Nomenclature.—A number of designations have been given to this disease Among them Campbell, Strong, Grier, and Lutz³ list "current bronchopneumonia of unusual and undetermined aetiology, atypical pneumonia with leukopenia, pneumonitis, acute influenzal pneumonia, and acute diffuse bronchiolitis "To confuse the issue further they add the belaboured title of "acute bronchiolitis with associated atelectasis" The designation "primary atypical pneumonia, aetiology unknown", advised by the Medical Department of the United States Army, excites patent objections; but until the aetiology is fixed, it would appear to be the most acceptable. Reimann⁴ maintains that viral pneumonias fall into two general groups (a) Sporadic or epidemic,

which is characterized by a long incubation and slight communicability, (b) Severe type, with short incubation period, which occurs in large epidemics of mild communicable diseases of the respiratory tract, usually in the cold months. In the former group he would place primary atypical pneumonia

Epidemiology.—Primary atypical pneumonia represents a limited aspect or complication of a general respiratory infection. With mounting incidences of primary atypical pneumonia there are encountered distinct accessions in the rates of upper respiratory disease. The consensus favours the position that the reaction to the problematic actiologic agent may occur with or without pneumonia. Indeed, the vast majority escapes this phase. Dingle, Abernethy, Badger, Buddingh, Feller, Langmuir, Ruegsegger, and Wood's qualify this position thus "Proof of such a hypothesis depends upon a demonstration of the causative agent. Until means of specific diagnosis becomes available, the classification of the acute illness of the respiratory tract remains empiric."

The disease has been reported endemically and epidemically over a wide area of the United States, Great Britain, and Europe Mobilization of young adults has unquestionably been a predisposing factor. Van Ravenswaay, Erickson, Reh, Siekierski, Pottash, and Gumbiner<sup>6</sup> indicate a peak of incidence twenty-four days after new recruits reached Jefferson Barracks Early fatigue, exposure, and an unaccustomed environment are given as probable explanations. With improvement in general physical state and the development of specific immunity, the chance of incurring primary atypical pneumonia after 85–40 days of residence was one-sixteenth of that before 24 days. The curve of incidence is higher in the late fall and early winter. Montgomery reports a rise in the Canadian Forces in the early fall with a sharp decline after mid-November. This experience has been closely paralleled in the American Army in Great Britain (Middleton<sup>8</sup>)

Most observers agree that primary atypical pneumonia is not highly communicable Contratto goes so far as to say that there was no cross-infection among attendants in the wards caring for this condition. Haight and Trollinger10 adduce somewhat similar evidence, although 2 of 8 cases arising in their own hospital staff had close contact with the disease in the course of their routine duties Young, Storey, and Redmond<sup>11</sup> take a very different A disproportionately high incidence of the disease among medical students of the first-year class was traced to contact with a laboratory instructor in anatomy and histology, who was suffering from the disease and his fellow-workers report three times the incidence among attendants upon the sick, as compared with other of the hospital personnel hypothesize a non-human or healthy human reservoir as the source of the propagation of the disease In spite of the earlier suggestions of transmission from birds and domestic animals, no support for a non-human reservoir has been adduced Healthy human carriers would seem to offer a logical explanation of the spread

Actiology.—The actiology of primary atypical pneumonia has not been definitely fixed Reimann<sup>4</sup> holds that confusion has arisen from an attempt to establish a single cause for a pneumonitis arising from a multiplicity of actiologic agents. Among them he lists the pneumonia of varicella, vaccinia, variola, psittacosis, ornithosis, lymphogranuloma venereum, lymphocytic choriomeningitis, influenza, and measles in man, and the viral pneumonias among animals used for experimental purposes. After this diverse group of actiologies has been given due consideration there remains a majority of instances in which the cause is unestablished. This group, in his judgment, should be termed "primary atypical pneumonia, actiology unknown"

Smadel<sup>12</sup> found 10 of 45 sporadic instances of primary atypical pneumonia dependent upon psittacosis Drew, Samuel, and Ball<sup>13</sup> point out that a single test is not adequate to fix this aetiology, since positive evidence may only be adduced from a rising titre of antibodies Favour<sup>14</sup>, in a careful analysis of three patients suffering from psittacosis, maintains that this condition is more common than suspected, but adds that complement-fixation studies are necessary to differentiate it from primary atypical pneumonia. Dingle and his associates made exhaustive complement-fixation studies with the virus of meningo-pneumonitis without establishing a causal relation in patients with primary atypical pneumonia. In explanation of the disproportional positive returns among negroes, they cite the cross-reaction between the virus of meningo-pneumonitis and that of lymphogranuloma venereum Ravenswaay and his co-workers6 add the important negative intradermal reactions for coccidioidomycosis among 200 patients with primary atypical pneumonia

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The general trend has been toward the acceptance of a virus aetiology Most recently, Eaton, Meiklejohn, and van Herick<sup>15</sup> inoculated 370 cotton rats intranasally with the sputum from 127 patients with primary atypical pneumonia and with suspensions of pulmonary tissue from 15 patients who had died of the disease. Twenty-eight per cent developed non-bacterial pulmonary lesions Hamsters inoculated with similar human materials disclosed like pulmonary disease. Consistent pathological changes have also been obtained in significant numbers upon serial passages. However, neutralization by convalescent human serum was not regularly observed in the affected animals, although homologous immune rabbit or cotton-rat serum neutralized these agents. Only 30 per cent of cotton rats inoculated with chick embryo cultures of bacteriologically sterile lung and filtered broth suspensions of sputum from patients with primary atypical pneumonia developed pulmonary lesions, whereas such materials regularly reproduced the characteristic histological changes in the lungs of hamsters. In two instances, serial passages in chick embryo cultures were accomplished. Appropriate studies seemed to separate the virus of primary atypical pneumonia from the psittacosis-lymphogranuloma series.

Pathology -With minor variations, descriptions of the histological changes in the lung of primary atypical pneumonia follow a common pattern Needles and Gilbert16 describe the process as an interstitial pneumonitis with an associated capillary bronchitis. Campbell and his associates group the pathological findings under the headings of bronchitis, peribronchitis, interstitial pneumonitis, and atelectasis They also describe local encephalitis with a complicating purulent myelitis of unknown aetiology in a patient coming to necropsy [The last-named pathological detail would appear detached from the primary aetiology -W S M ] Dingle and his co-workers consolidate the pathological changes in one fatal subject under the headings of hæmorrhagic interstitial bronchial pneumonia, acute bronchitis, acute follicular splenitis, and mesenteric lymphadenitis. They add the bronchoscopic evidences of acute tracheobronchitis in the affected lobe, with escape of the unaffected This reaction was much more violent in primary atypical pneumonia than in the isolated study of a patient with pneumococcic pneumonia The alveolar stroma is thickened by an infiltration with round cells, wandering or plasma The alveolar exudate is predominantly monocytic (Fig 40). Occasional macrophages are noted Neutrophils and fibrinous exudate are less abundant Varying degrees of hæmorrhage may be noted in different sections of the same lung Hyalinization of the fibrinous deposit has been repeatedly observed, but there is a lesser tendency for desquamation of the bronchiolar and alveolar epithelium than in influenza Inclusion bodies are described Organization of the pulmonary exudate is encountered. The bronchial reaction is characterized by a neutrophilic exudation with an excess of mucus. At electasis, lobular and more extensive, is likewise noted. Congestion of the pulmonary vessels is quite variable, but as a rule it is not extreme. Only exceptionally is there involvement of the pleura. Its escape is one of the significant departures from the pulmonary reaction to bacterial invaders.

Chnical Course.—Particularly has the clinical course of primary atypical pneumonia been clarified by recent studies. The incubation period is generally stated as 14-21 days, but it may be as short as 2 days. Its inception is insidious in a majority of instances—67.2 per cent (Van Ravenswaays), 74 per cent (Dingles) Feverishness, general malaise, chilliness, and headache are common premonitory symptoms. In certain instances the headache has been



Fig 40 —Photomicrographic reproduction of section of lung in primary atypical pneumonia ( $\times$  240)

very severe, as a rule, it is quite mild. In the experience of most clinicians, sore throat is more significant than coryza. Hoarseness has been a frequent symptom in recent months. A minority of patients experience a frank chill at the onset. Substernal pain may succeed the catarrhal upper respiratory phase. Perhaps most significant is the cough, which is stressed in all accounts except that of Contratto, who minimizes this detail. Early, the cough is paroxysmal and non-productive. Its harassing quality is particularly emphasized. Later, there succeeds a period of production of glairy, tenacious mucus, which, in turn, is followed by abundant mucopurulent sputum, without offensive odour. For practical purposes 'prune-juice' or rusty sputum is negatively pathognomonic of primary atypical pneumonia. However, with the paroxysms of coughing, blood-streaking of the sputum is occasionally developed and, rarely, small amounts of bright-red blood may be expectorated. While substernal discomfort and soreness in the abdominal and thoracic muscles may occur as a result of coughing, pleuritic pain is very unusual.

The constitutional reaction to this infection is extremely variable. As a rule, the febrile reaction and prostration are mild and of short duration. While Campbell and his co-workers give 5 I days as the average febrile period of 200 patients, it may be stated with assurance that a majority of subjects with this disease are not sick enough to seek medical advice or, if reporting, are not

deemed ill enough to have the confirmatory roentgenographic studies to establish the diagnosis. On the other hand, a minority of the group may have a remittent fever, 102°-105°, for ten days to two weeks and the exceptional patient may run a low-grade remittent fever for weeks and months without demonstrable complications (Hein<sup>17</sup>) Sweating may occur through the fastigium and vasomotor instability continue into convalescence

In the early catarrhal phase, injection of the nasal and faucial mucosa without exudation may constitute the sole finding Prostration and toxemia are usually slight to moderate Dyspnæa and cyanosis are rare manifestations, unless there be extensive bronchial obstruction Occasionally, an asthmatic type of breathing may supervene Herpes labialis has been reported in a few patients, but its occurrence virtually eliminates primary atypical pneumonia After a delay of 48 to 72 hours the sparse pulmonary physical signs usually make their appearance Suppression of breath-sounds, with fine crackling râles in a localized area, constitutes the most common finding Signs of massive consolidation rarely develop Occasionally, signs of patchy consolidation are found adjacent to those of atelectasis and emphysema. The changing order of the latter signs, rather than the more substantial support of a modification by bronchoscopic aspiration, has led to an interpretation of temporary partial or complete bronchial obstruction Pleural friction rubs are extremely unusual Bradycardia, absolute as well as relative, may be encountered With the progression of the clinical picture, the fine crackling râles become larger and more moist At times, a sibilant and sonorous quality is added Such manifestations may be local or general Signs of fluid may develop without anticipatory pleuritic pain Among others, Owen<sup>18</sup> describes splenomegaly as a manifestation of this condition

Laboratory Findings.—The absence of the ordinary pulmonary pathogens in the sputum is the most significant laboratory finding. Various bacteria may be isolated from time to time, but there is no especial preponderance. The leucocyte count ranges from 6000 to 11,000 in a majority of instances, but occasionally there is a slight leucopenia, and, conversely, a moderate leucocytosis has been met. The differential count has received relatively little attention. Middleton reports a monocytosis of 10–18 per cent. Young and his associates determined ranges of 10–25 per cent monocytes in 11 patients, on admission. They likewise report eosinophilia of 5–11 per cent in 8 patients at various stages of the disease. The blood-cultures have regularly been negative. The sedimentation-rate of the crythrocytes is speeded and may be used as a prognostic index. False positive Wassermann reactions, becoming negative in convalescence, have been encountered. The albumin-globulin ration is inverted at times.

One of the most interesting outgrowths of the studies in primary atypical pneumonia has been the recognition of cold agglutinins in the blood. Peterson, Ham, and Finland<sup>19</sup> in America, and Turner<sup>20</sup> independently in Great Britain, reported the presence of cold agglutinins in primary atypical pneumonia. By selective absorption and the titration of activity on the crythrocytes of several species of domestic and laboratory animals, Turner and Jackson<sup>21</sup> find that these agglutinins possess the properties of auto-antibodies which react equally with cells of all four major human blood-groups. Of the lower animals, there is appreciable effect only upon the cells of the rabbit and the rat. Shone and Passmore<sup>22</sup> report the presence of auto-hæmagglutinins in 54 patients with pneumonitis. Their introductory comment is particularly significant. "While investigating cases of fever we observed that when a drop of blood was placed on a slide, the red corpuscles immediately separated into clumps. Furthermore, when an attempt was made to count them, they were agglutinated in

the diluting chamber of the hæmocytometer pipette" Control studies with a variety of conditions, including respiratory infection, tuberculosis, infective hepatitis, and leprosy, showed no such parallel results, but chronic malaria gave auto-hæmagglutination in 20 of 37 patients A total absence of autohæmagglutinins was observed in a large group of healthy, afebrile medical and non-septic surgical patients Seven of 35 septic battle casualties showed hæmagglutinins Dameshek23 and Helwig and Freis24 report the appearance of hæmagglutinins in primary atypical pneumonia in other connexions. Turner, Nisnewitz, Jackson, and Berney, 25 in a survey of 132 patients with conditions other than primary atypical pneumonia and mumps with orchitis, found only 5 with cold agglutinins in dilutions above 1-16 and none above 1-64 Of 83 patients with primary atypical pneumonia, 44 showed cold agglutunns in dilutions of at least 1-32 and 23 disclosed them in dilutions of 1-128 and over No agglutinins were found in influenza, pulmonary tuberculosis, hæmolytic sore throat, sinusitis, or common cold Their occurrence in pneumonia virtually excludes a pneumococcic aetiology Only in paroxysmal hæmoglobinuria and trypanosomiasis are hæmagglutinins found in such high frequency as in primary atypical pneumonia. In the opinion of these authors, the cold agglutinin is "related heterogenetically to some specific and fundamental distinctive property of the infecting organisms" Further experience in many Army laboratories in the European Theatie of Operations indicates that the presence of cold agglutinins strongly supports the diagnosis of primary atypical pneumonia, but their absence does not exclude the same -W S M ]

Roentgenology.—Sharply contrasting with the paucity of physical findings in this condition are the multiplicity of pulmonary changes determined by roentgenography. There is no parallelism between the extent of pulmonary changes shown on radiography and the clinical severity of the disease (Drew et al 13). The earliest alterations may be delayed several days after the inception of symptoms. Haight and Trollinger 10 recommend the following descriptive terms—homogenous, linear, mottled, and mixture. Middleton's groups these changes under the following headings. (1) Increase in the tracheobronchial lymph-nodes. (2) Ground-glass haziness of the involved lung or area of the same. (3) Reticulation of the pulmonary architecture. (4) Nodular areas of increased density.

Linear areas increased in density radiate from the enlarged tracheo-bronchial lymph-nodes Early diffuse haziness gives rise to a ground-glass appearance of extensive areas of the lung, usually in the bases As a rule, the pneumonic process begins centrally and extends peripherally Stein and Kresky<sup>26</sup> report many instances of peripherally isolated lesions. The individual densities may range from miliary to conglomerate proportions, and the latter may by fusion involve a lobe or lobes Contratto reports 20 per cent with lobar distribution Campbell and his associates adduce substantial evidence in support of an atelectatic theory in that 19 per cent of their subjects showed a shifting of the mediastinum toward, or an elevation of the diaphragm on, the side of pulmonary involvement. The transient pulmonary changes which may occasionally appear or disappear overnight, support the theory of intermittent bronchiolar or bronchial obstruction Crysler<sup>27</sup> advises lateral radiographs for exploration of the pulmonary areas maccessible to the conventional anteroposterior or postero-anterior projections. The more massive densities are rarely homogeneous Seeds and Mazer28 report a "wire grass" type of infiltration which they designate as pseudofibrosis. This feathery reticulation has been interpreted as arising from the interstitial changes in the alveolar stroma (Middleton8) Significant though the described changes may be, no aetiological diagnosis should be attempted on roentgenological grounds. According to Levene and Sterman<sup>29</sup>

resolution begins in the periphery and progresses towards the hilum, but persistent radiographic evidence of interstital pneumonitis and limited atelectasis may be observed for a long period after clinical convalescence. Clearing of the inflammatory process to radiography may be complete in 5 to 14 days. Campbell and his co-workers, in 100 subjects followed by radiographs, report 57 per cent clearing in 10 days, 85 per cent in 20 days, and the residual 15 per cent after a further period of 20 days. There is no correlation between the radiographic findings and clinical recovery. Certain patients with this condition show complete clinical recovery before radiographic clearance. Conversely, others have persistence of cough and rales for some time after the radiograph is clear.

Differential Diagnosis.—Undoubtedly, the clinical and radiographic diagnosis of pulmonary involvement is made in a minority of patients suffering from primary atypical pneumonia Many differential considerations enter into the diagnosis of primary atypical pneumonia Among these are tuberculosis, brucellosis, tularæmia, typhoid fever, paratyphoid fever, sepsis, common cold, bacterial pneumonia, influenza, psittacosis, Q fever, coccidioidomycosis, and Since the radiographic examination does not offer aetiological differentiation, the clinical course and laboratory findings assume unusual The natural history of primary atypical pneumonia, paucity of physical findings, normal to slightly elevated leucocytes, the absence of ordinary bacterial pathogens in the sputum, disproportionate pulmonary changes to radiography, and the failure of response to chemotherapy are significant details priate laboratory methods will exclude tuberculosis, brucellosis, tularæmia, typhoid fever, sepsis, psittacosis, Q fever, and coccidioidomycosis Bacterial pneumonia, whether patchy or lobar, usually has a more precipitous onset In pneumococcus lobar pneumonia the high incidence of herpes, respiratory impairment, disproportional constitutional symptoms, cyanosis, pleuritic pain, classical signs of massive consolidation, pleuritic friction rub, rusty sputum, pneumococci in the sputum, leucocytosis, blood-culture positive for pneumococcus, and the lobar distribution of a homogeneous density upon radiographic study serve as significant differential points Ordinarily, influenza has a much stormier onset, greater constitutional symptoms, herpes, bradycardia, more serious pulmonary complications, leucopenia, and profound post-infectious asthenia

The possibility of confusion with pulmonary tuberculosis has been repeatedly cited. Nor is this mistake unilateral, since tuberculous lesions have not infrequently been misinterpreted as primary atypical pneumonia in recent years. While doubt may exist upon the preliminary studies, a continued period of chinical observation, repeated radiographic studies and examinations of the sputum, will clarify the issue in a relatively short period in most instances. Silent pleural effusions present a further problem in differential diagnosis. Tuberculous until proven otherwise, would probably be the safest policy. Both in primary atypical pneumonia and tuberculous pleurisy the effusion is serous and the lymphocyte is the predominant cellular element in the fluid. Bacteriologic investigations, including animal inoculation, may settle the question. The Mantoux reaction may be helpful [Primary atypical pneumonia should not be the primary consideration in the absence of a clear-cut history or radiographic evidence of significant (rapidly metamorphosing) pulmonary lesions.—W S M ]

Prognosis.—Under ordinary circumstances, primary atypical pneumonia is a benign infection. In a majority of instances the average febrile course is 5 days. Contratto gives 10 days as the average period of hospitalization. In the Army experience, Dingle and his associates find that this period is

extended to 31 7 days. Recurrences are unusual, but Owen<sup>18</sup> reports 17 of these episodes in 738 patients. The mortality-rate among 1862 patients with primary atypical pneumonia reported by van Ravenswaay and his associates<sup>6</sup> was 0.26 per cent; but even this low figure exceeds the general experience

Complications -As a rule, primary atypical pneumonia runs a simple. uncomplicated course There may occur certain significant complications The most common among these is cough fracture of the ribs 5,8 Since pleurisy is uncommon in this condition, this complication should be suspected whenever persistent thoracic pain, exaggerated by coughing, deep breathing, or muscular effort, occurs Spontaneous pneumothorax is occasionally encountered 8 Silent pleural effusions of a serous order may develop and attain considerable proportions While empyema has been cited as a complication, in the European Theatre of Operations it has occurred in only one instance, when it complicated pulmonary abscess succeeding primary atypical pneumonia Abscess of the lung is an unusual sequence of this infection. In patients with or without antecedent evidence of sensitivity, bronchitic asthma may constitute an uncomfortable complication (Middleton, 8 Favour14) Pulmonary infarction from thrombosis or embolism has been reported Bronchiectasis may occasionally develop after primary atypical pneumonia Blades and Dugan<sup>50</sup> define an unusual state of "pseudo-bronchiectasis" attendant upon this condition According to their observations, a temporary dilatation of the bronchi occurs in the course of the disease and disappears in convalescence Dickies1 has observed two instances of the relighting of quiescent pulmonary tuberculosis by primary atypical pneumonia Serous pericardial effusions may occasionally be encountered Rarely, myocardial degeneration may manifest itself in arrhythmias or electrocardiographic changes from faulty conduction [In certain patients it is impossible to exclude other actiological factors -W S M]

A small minority of patients with primary atypical pneumonia may manifest complications referable to the central nervous system. Not infrequently, the attack may be initiated by evidences of meningismus. Toxic psychosis, including depression, hallucinatory and illusionary states, and mania have been encountered. Fortunately, in all instances these mental manifestations have had a short duration. Encephalitis may complicate primary atypical pneumonia. Perrone and Wright. reported the death of a patient from primary atypical pneumonia with this complication, but as a rule its manifestations are minimal and no sequelæ have been met. The implication of a possible neurotropic factor in the virus of primary atypical pneumonia must not be overlooked. Furthermore, belated post-encephalitic manifestations analogous to parkinsonism of epidemic encephalitis could conceivably eventuate in such subjects.

The occurrence of cold agglutinis in the course of primary atypical pneumonia may lead to further complications. Helwig and Freis<sup>24</sup> encountered acrocyanosis in one such instance. Dameshek<sup>23</sup> and Ginsberg<sup>23</sup> report acute hæmolytic crises in the presence of cold agglutinis in patients with primary atypical pneumonia. The former was unable to exclude the possible contributory role of sulphonamides in the episodes under his observation, but the latter's patient had had no chemotherapy

Treatment.—A division of opinion relative to the isolation of patients with primary atypical pneumonia is encountered. Van Ravenswaay and his co-workers report no essential difference in the incidence of primary atypical pneumonia among patients with upper respiratory infections kept in wards with this disease and those carefully isolated. In general, the usual precautions—i.e., cap, mask, gown, and toilet of hands—that are observed in all

diseases communicated by respiratory secretions, may logically be applied Since the conjunctival sac may be the portal, the wearing of goggles is advised Measures to lay the dust and the use of aerosol sprays have been employed 84

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The treatment of the active infection is largely symptomatic Sulphonamides and penicillin are without specific effect. However, in the more toxic subjects with high fever, leucocytosis, and suggestive pulmonary pathogens in the sputum full therapeutic doses of sulphadiazine, preferably controlled by determinations of the levels in the blood, may be administered until the diagnosis is affixed Usually, a failure of response in 48 hours will have raised some question as to the propriety of such therapy, if other clinical and labor-Codeine in full doses, ½ gr every 2 or 3 hours, may atory data be inconclusive prove ineffective, and morphine be required to control the cough has distinct advantages in this direction Stimulating expectorants such as terpin hydrate, ammonium chloride, or potassium iodine may afford considerable relief Inhalations of steam, with or without compound tincture of benzoin, may allay irritation. Anoxia is met by inhalations of oxygen Adrenaline may be required to control asthmatic dyspnæa Postural drainage has distinct advantages in certain patients with abundant bronchial secretions Convalescent serum and whole blood afford no evident advantages 11,18

X-ray treatment of this condition has received considerable attention in the Correll and Cowan<sup>85</sup> report favourably upon its effectiveness past two years Only one of 23 patients so treated within 4 days of admission failed to respond In the remaining 22 the febrile period, sick days, and complete resolution were reduced by one-half Delayed resolution was speeded by this method heimer<sup>36</sup> reports clinical cure in 45 of 56 patients receiving X-ray therapy. Pulmonary consolidation disappeared in 3 to 5 days after initiation of therapy. The best results were obtained early in the course of the disease Perhaps the most significant therapeutic response was in the control of the cough, even when therapy was initiated late in the disease. He cautions against giving doses of over 100 r early in the course Under these conditions severe systemic reactions, such as chills, cold sweats, and convulsions, may occur The advised dose is 35-50 r for children and 50-60 r for adults in the first 2 or 3 days of the disease; 50-70 r for children and 70-90 r for adults if the disease is The technique employed is as follows: 130-150 kv. over one week in duration according to the size of the chest and thickness of the skin and muscle; 30 ma.; 05 mm Cu plus 1 mm Al filtration, 50 cm. anode-skin distance, average dose 50 r measured in air, through portals covering the involved parts of the lung,  $20 \times 20$  cm

Convalescence.—This period is usually short, but at times it may be protracted. Post-infectious asthenia is rarely marked. In general, the policy in the European Theatre of Operations permits some physical activity as soon as the patient is afebrile and free from constitutional symptoms. Discharge from the hospital is delayed until complete resolution of the pulmonary changes However, van Ravenswaay is established upon radiographic examination and his associates divide convalescence into four arbitrary stages: acute (fever-free for 4 days), active (fever-free for 14 days), subsiding (after 14 afebrile days and until physical examination, radiograph, and sedimentationrate are normal); and convalescent (from subsiding phase to full duty). This conservative plan is applicable only to the more seriously affected. In general, complete convalescence of the uncomplicated subject who reaches the hospital may be anticipated in three weeks.

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#### PROSTATE, SURGERY OF.

Hamilton Bailey, FRCS

Prostatitis.—It is unfortunate that many practitioners consider chronic prostatitis is necessarily due to gonococcal urethritis. This point of view is an injustice to many patients, because the colon bacillus and the staphylococcus are the most frequent causative organisms of chronic prostatitis. It is well known that chronic prostatitis may be a focus of infection which produces metastatic manifestations in other parts of the body, also that the prostate itself may be infected from distant foci, such as teeth, tonsils, furunculitis, and infections of the intestinal tract. Symptoms of chronic prostatitis and seminal vesiculitis do not usually attract attention to the affected area.

#### R B Henline<sup>1</sup> divides sufferers into three types -

Type 1—Symptoms predominantly urinary This is the largest group A mild urethral discharge often makes the patient fearful that he has contracted gonorrhea Any type of urinary symptom may be present, and none are pathognomonic of this disease Pain is of varying degree, it is usually mild, and is referred to the perineum or rectum. It may be aggravated by sitting in a hard chair Relief is occasionally obtained by crossing the knees or exerting pressure on the perineum.

Type 2—May be classified as silent prostatitis. Arthritis, bursitis, myositis, neuritis, etc., are only explained when pus from the prostate has been obtained. Particularly common is lower back pain, sometimes extending to the pelvic region and down the legs. This pain the patient usually attributes to rheumatism or a strain at work, with which his medical adviser too often agrees. On several occasions in the Medical Annual attention has been drawn to prostatitis as the cause of lower back pain, but still many cases which should be having urological treatment are having orthopædic treatment and physiotherapy. The nervous system is frequently affected and definite neuroses may make their appearance.

Type 3—Comprises cases of sexual dysfunction They are fairly common, but considering the prevalence of prostatic infections, it is remarkable that they are not more in evidence than is the case Premature ejaculations, weak erections, and impotence head the list

Diagnosis.—The examining finger may detect no gross change in the prostate, more frequently it reveals an enlarged, nodular, boggy, or indurated organ. The infected ducts may be temporarily occluded by pus and debris, and two or three prostatic strippings at 3 to 5 days' intervals are often required before the presence of pus can be demonstrated. The practitioner should make a proper examination of the prostate a routine procedure when searching for a focus of infection.

Local Treatment—Once the diagnosis of chronic prostatitis has been established, massage per rectum is the most important single measure in its treatment. Massage of an infected area seems unphysiological Nevertheless, excellent results have accrued from this form of treatment the world over Massage evacuates pus and bacteria from the prostatic duets, and increases the blood-supply to the gland.

#### PLATE XXXIII

# CANNULIZING THE VASA DEFERENTIA AND INJECTING THE PROSTATE

(HAMILTON BAILEY)



Fig. A —Cannula for injecting mercurochrome into a vas deferens



Fig. B.—Injecting mercurochrome solution into the prostate via the perineum

Technique of prostatic massage. The knee-elbow position is generally used, but in difficult cases the Picker position (Fig. 41) will be found more satisfactory. The gloved index finger, well lubricated, is slowly inserted into the rectum as far as possible. Pressure is begun above the prostate on one side, so as to empty the vesicle. This is repeated several times, and then carried out on the other side. The finger is then brought down on to the prostate, and several strokes are made on the gland on either side, from the uppermost portion, downwards towards the middle line. The massage is concluded by several strokes over the middle line to express the fluid from the main ducts into the urethra. Prostatic fluid appears at the external meatus and is collected on a glass slide for examination. While gentleness is imperative during the first

few treatments, more firm pressure may be required in stubborn cases

The next important element in local treatment is to search for, and, if present, treat, a urethral stricture Chronic prostatitis is associ-

ated with urethral stricture frequently

General Treatment—One gramme of sulphathnazole four times daily for ten days, in conjunction with the local treatment, is beneficial in many cases. Henline also advocates that sulphathnazole be given 24 hours before and 24 hours after urethral dilatation. Normal intercourse should aid in the treatment of non-gonococcal prostatitis, and should be permitted while massage is being carried out. Chronic prostatitis and seminal vesiculitis may be very slow in responding to treatment, but,



Fig 41 -The Picker position

in general, the outlook is good, provided much patience and co-operation is observed by both the patient and his doctor. Finally, Henline urges that the practitioner should make a routine examination of the prostate as frequently as he does of the teeth and the tonsils, for a focus of infection

In rebellious cases of chronic prostato-vesiculitis, I have cannulized the vasa with the special cannula (Plate XXXIII, Fig. A) made by Vann Bros, and at the same time have injected the prostate through the perineum (Plate XXXIII, Fig. B) with 1 per cent mercurochrome, as was described in the MEDICAL ANNUAL of 1937 The cannulæ in the vasa are left in situ for a week or ten days, and daily injections of mercurochrome solution are instilled [I have carried out this measure in at least 25 cases. I have been unable to trace them all, but only 3 out of 17 are unsatisfactory, and considering the chronicity of these cases, and the failure of other methods, I am well satisfied with the results. Possibly penicillin would be better than mercurochrome—H B]

Carcinoma of the Prostate.—B S Barringer<sup>2</sup> considers that a stage has been reached where orchidectomy and diethylstilbæstrol medication should be the treatment in all cases of prostatic carcinoma, except for those early cases where the neoplasm is confined to the prostate, when the advisability of total prostatectomy should be considered

A. A Roth and H Turkel³ have found prostatic biopsy valuable in the diagnosis of early carcinoma of the prostate They use a modified Turkel needle for the purpose The Turkel needle is a sternal marrow biopsy needle used in the United States of America

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#### PRURITUS ANI.

W B Gabriel, M.S, F.R CS.

In a short paper, A J Cantor<sup>1</sup> states that pruritus an is a symptom of many diseases, and although he describes one group, the "cryptogenic" or idiopathic. in which the exact cause is not discoverable, he considers that all cases are actually secondary, he classifies them under 9 headings, the most important group being due to local rectal conditions. In many cases pruritus is prolonged by ill-advised local treatment, and a local 'dermatitis medicamentosa' is not uncommon. A complete physical and rectal examination is necessary Treatment must depend on the results of examination If the pruritus is mild and no local abnormality is detected the patient is given a month's trial of ordinary hygenic measures, with local use of a starch or talcum powder. A local abnormality such as fistula, fissure, or hæmorrhoids is dealt with surgically. X-ray therapy is not recommended Fungus infections are treated with halfstrength Whitfield's ointment, or with a paint composed of 50 per cent camphor and 50 per cent phenol applied to the perianal region thrice daily. In resistant cases injection of oil-soluble anæsthetics may be tried, but the author prefers the method of tattooing with mercuric sulphide [A paper by R Turell and A W M. Marino on the tattooing method was annotated in the MEDICAL Annual for 1943, p 273 | Cantor states that he has had excellent results from tattoo therapy in 32 cases of severe pruritus ani More recently, in 21 cases, he has combined the tattooing with subcutaneous neurotomy with still better results A low spinal anæsthesia is preferred for the operation. The precise method of neurotomy is not described

Another approach to the problem of anal pruritus is indicated in a paper by L H Slocumb <sup>2</sup> He brings forward evidence that there is a chemical irritant in these cases, alkaline in reaction and probably metabolic in origin, which favours the growth of Gram-negative bacteria. Treatment has been on the lines of correcting a high alkaline pH in the rectum and colon. dietetic management consists in pushing foods which produce lactic acid, such as milk, buttermilk, acidophilus milk, lactic whey, cheese, and beta-lactose, while restricting or eliminating foods which produce alkaline putrefaction such as meat and citrous fruits. Hydrochloric acid before and after meals is recommended when the bowel actions are too frequent. Locally, in order to reduce alkalinity, a rectal douche of dilute lactic acid is recommended at bedtime, one or two ounces of 2½ per cent lactic acid solution being added to one or two pints of warm water, this maintains a pH of between 6.5 and 7.5 and promotes the growth of Gram-positive bacteria

REFERENCES — Lancet, 1944, 1, 692, Amer J digest Dis 1943, 10, 227 (abstr in Surg. Gynec Obstet 1943, 77, 396)

PSYCHIATRY, SOCIAL ASPECTS OF. (See Social Aspects of Psychiatry)

PSYCHIATRY OF WAR. (See WAR, PSYCHIATRY OF)

#### PSYCHOLOGICAL TESTS. Aubrey Lewis, M.D., F.R.C.P

In an effort to increase the clinical usefulness of the Rorschach test W. D Ross¹ has devised a method of scoring and rating which can be applied with the minimum of expert knowledge—Signs which are more frequent among neurotic subjects are scored in such a way as to yield an instability rating, and a corresponding disability rating is obtained from those signs which are common in cerebral disease—Ross has applied this to soldiers in the Canadian Army and has found it of some, if limited, value in recognizing the degree of disorder present, the disability ratings have, he thinks, helped to assess the probable degree of further recovery—[It will be necessary, as Ross himself points out,

to determine the reliability of these ratings when used by different examiners, and to test their clinical applicability on a larger material, before they can be trusted —A L ]

In a psychological and physiological study of a group of women engaged in extremely fine work, I Mann and D Archibald² came to the conclusion that a person selected for such a task should be orthophoric, and should have well-developed stereopsis and a corrected visual acuity of 6/6, but that psychological attributes are apparently less important, only one test, however—the group Rorschach—was employed in this part of the investigation

The common belief that hysterical persons are more suggestible than others has not been borne out by tests such as the "body-sway" devised by Clark Hull<sup>3</sup> The form of suggestibility which can be measured by this test and the Chevreul pendulum is, however, much more in evidence among neurotic persons as a group than among normals H J Eysenck<sup>4</sup> has demonstrated this. 63 per cent of neurotic males and only 7 per cent of non-neurotic males were found to be suggestible on the body-sway test, and 42 per cent of neurotic females as against 8 per cent of non-neurotic ones.

Eysenck<sup>5</sup> also subjected the traits of 700 neurotic soldiers to a statistical examination by the method of factor analysis. 14 per cent of the variance was accounted for by a general factor of neuroticism and instability, and 12 per cent was accounted for by a factor of "desurgency" or inhibition, dividing the patients into a hysterical and an affective group

A thorough study of the intellectual impairment in head injuries has been made by J Ruesch. The tests used were—subtracting serial sevens from 100, pictorial absurdities, pictorial discrimination, naming colours, reading, and "plan of search." It appeared that the mental functions most affected in the patients were speed, judgement, and ability to keep up a sustained effort Half of the subject had slight intellectual defects, which gradually became less marked, the impairment was related to the severity of brain damage. [As previous studies have shown, psychological tests such as these can reinforce clinical observations but cannot replace them. It is doubtful whether Ruesch's statement that the defects usually found in head injuries differ from the types seen in general paresis or in the senile psychoses can be accepted unless by the latter are meant only advanced and conspicuous cases—A L.]

Further observations on psychometric findings after head injury are presented by W R Reynell <sup>7</sup> He stresses that the most significant indication of cerebral damage is the presence of intellectual loss and that the findings become more significant the longer the period between the head injury and the date of testing Reynell concluded that the deterioration in performance tests, in arithmetical reasoning, digit retention—especially backwards in memory—and "relational thinking" is characteristic of patients with head injury

REFERENCES — 1 Imer J Psychiat 1944, 101, 100, 2 Brit med J 1944, 1, 387 3 Hypnosis and Suggestability 1933, 4 mer J Psychol 1944, 57, 406, 3 ment Sci 1944, 90, 851, 4 mer J Psychiat 1944, 100, 480, 7 ment Sci 1944, 90, 710

PSYCHOPATHOLOGY AND NEUROSES (See Neuroses and Psychopathology)

PULMONARY OSTEO-ARTHROPATHY. A E Barnes, MB, FRCP Pulmonary osteo-arthropathy has been admirably discussed by B M Fried, who records 4 cases with autopsies The chief features of his four cases were respectively (1) Acromegalic appearance, tufting of the terminal phalanges, splanchnomegaly, atrophy of testicles, and a large adeno-hypophysis showing pronounced hyperplasia of eosinophilic elements, (2) Acromegalic appearance, bulldog' scalp, hirsutism, macroglossia, tufting of terminal phalanges, and

thickening of the crainal vault, (3) Mongoloid appearance, secondary male characteristics, large cortical adenoma of the adrenal, several adenomas of the thyroid, and hyperplasia of cells of anterior lobe of pituitary with eosinophil cells in the majority, (4) Coarse acromegalic features, gynecomastia, several cortical adenomas of the adrenals, enlargement of the sella, and tufting of the terminal phalanges. He points out that Touraine and Golé² under the name of 'pachydermie plicaturée avec pachypériostose des extrémités', have drawn attention to quite similar cases which are not associated with pulmonary lesions. He also points out that the bony changes may begin as porosis in the bone itself and not be primarily a periosteal condition. An endocrine imbalance is suggested as the mechanism whereby the changes are caused

REFERENCES -1Arch intern Med 1948, 72, 565, Pr med 1935, 43, 1820

#### PULMONARY TUBERCULOSIS. (See Tuberculosis, Pulmonary)

#### PULSATING EXOPHTHALMOS.

Lambert Rogers, M Sc, F R C S.

Probably the first description of pulsating exophthalmos was given in 1809 by Benjamin Travers <sup>1</sup> Any retrobulbar mass may produce exophthalmos, but usually a vascular lesion is the cause of the pulsating form. The majority of cases are unilateral and result from a fistulous communication between the internal carotid artery and the cavernous sinus in which it les. The fistula is usually the result of a head injury, but may come about spontaneously as the result of a congenital deficiency or disease of the artery. A striking case of this type precipitated by blowing the nose was reported by Lambert Rogers and R. Parry<sup>2</sup>

A review of the published reports of cases of pulsating exophthalmos was made in 1924 by G C Locke<sup>3</sup> Now J D Martin, jun, and R F. Mabon,<sup>4</sup> of Atlanta, Georgia, have reviewed the published cases since 1924 and report 5 of their own Diagnosis is usually easy Following a head injury, proptosis and a bruit develop Symptoms in 234 cases which they have been able to collect were as shown in *Table I* 

Table I—Symptoms Reported in 224 Cases of Pulsating Exopethalmos

Symptom	Number
Bruit Pulsation Chemosis Diplopia Headache Visual disturbance	191 179 159 76 71 66

The methods and results of treatment are shown in Table II

Table II —RESULTS OF TREATMENT IN 188 CASES (TOTAL REPORTED SINCE 1924)

METHOD USED	No of Cases	CURED	IMPROVED	UNIM- PROVED	DEATHS	Hemi- Plegia
Ligation of internal carotid artery	47	25	15	8	2	2
carotid artery	48	80	9	1	3	
Combination of ligations (veins and arteries) Direct intracranial liga-	41	27	11		2	1
tion (Dandy) Non-operative treatment	6 51	4 9	22	17	2 8	=

The authors of this paper discuss the various methods of treatment and their final conclusion is in favour of carotid ligation after a course of digital compression

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Carotid ligation is always somewhat hazardous, cerebral effects may be immediate or delayed Electro-encephalograms taken after temporary occlusion, however, will show whether this is likely to produce sufficient anæmia to result in cerebral disturbances (Lambert Rogers, 19445) The effect of digital compression on the bruit should always be tried, because it may occasionally be found that the contralateral artery to the side of the protrusion controls it When carotid ligation has been decided upon, and a study of temporary occlusion made with the aid of the electro-encephalograph has shown that the artery may be ligatured, it should not be tied in continuity, but divided between ligatures, as late embolic effects are less likely to follow division (Lambert Rogers, 19446)

REFERENCES — J Amer med Ass 1943, 121, 380, <sup>2</sup>Brit J Surg 1929, 105, 179, <sup>3</sup>Ann Surg 1924, 30, 1, <sup>4</sup>J Amer med Ass 1943, 121, 380, <sup>4</sup>Brit J Surg 1944, 32, 309, <sup>4</sup>Lancet, 1944, 2, 90

#### PURPURA, THROMBOCYTOPENIC: SPLENECTOMY IN.

Stanley Davidson, M D, FRCP. H W Fullerton, MD, MRCP.

The proper treatment of idiopathic thrombocytopenic purpura is often a matter of considerable difficulty The main reasons for this are that spontaneous cure is not infrequent, whereas the results of splenectomy cannot be guaranteed There is, therefore, a distinct reluctance on the part of many physicians to recommend operation, and this is increased by the obvious immediate dangers of major surgery in individuals suffering from a hæmor-The recent paper by H Evans and K M A Perry,1 in rhagic condition which they analyse a series of 75 cases treated at the London Hospital between 1927 and 1938, is particularly welcome because it is only by such surveys that our ideas of the best treatment can be clarified Incidentally, there is need for many more attempts of this kind to assess as accurately as possible the indications for, and the benefits to be derived from, different forms of treatment, especially surgical, in a wide variety of diseases It is not proposed to give in detail the results obtained by Evans and Perry, the paper should be read carefully by all those interested in the disease But a few points are particu-Of the 75 cases, 30 occurred before puberty and were equally larly instructive divided between the sexes Of this group, spontaneous recovery occurred in 10, splenectomy had a successful result in all of the 5 males but in none of the 4 females in whom it was performed, the mortality in the period of observation was 16 per cent Of the 45 cases occurring after puberty 38 were females, only one of whom recovered spontaneously. Splenectomy was successful in both of the 2 male patients and in 7 of the 13 females in whom it was done, and the mortality in the period of observation was 40 per cent, one-half of the deaths being due to subdural hæmorrhage. These figures are in keeping with the modern view that spontaneous cure is much more likely to occur in children than in adults, so that treatment with blood transfusion should be continued for longer in the former group before having recourse to splenectomy adults splenectomy may be expected to cure at least half the cases, but we have no reliable means of foretelling which cases are likely to be cured by the operation The figures given suggest that males are more likely to be benefited by splenectomy than females This is a new observation, and it is obviously necessary to have more results before it can be regarded as an established fact

#### PYELOGRAPHY.

Hamilton Bailey, FRCS

H E Carlson¹ has found that the best method of clearing the intestinal tract of gas before pyelography is the 5 per cent saline enema, which is made as follows one level medicine glassful of common table salt in 1000 c c 'of warm water. The ideal time to take the X-ray photograph is about one hour after the administration of the enema. He recommends this enema as a general-purpose enema as well

R O Pearman<sup>2</sup> finds the most satisfactory excretory pyelograms are obtained by restricting fluids to 250 c c for the previous 8 hours, administering 30 c c of castor oil at 7 p m and an enema saponis at 7 a m

References -1 South med J 1943, 36, 328, 2New Engl J Med 1943, 228, 507

#### RADIOLOGY: DIAGNOSIS.

James F Brailsford, MD, PhD, FRCP, FICS

#### RESPIRATORY TRACT

Diagnosis of Bronchiectasis in Young Adults—Though this disease was formerly regarded as comparatively rare, W A Evans and L J Galinsky,¹ of the Medical Corps of the Army of the United States, report "Bronchiectasis has been the most common chronic pulmonary condition at this station" Pulmonary tuberculosis appears to have been excluded far more effectively, though bronchiectasis carries with it a prognosis as serious for the life and health of the individual

The disease usually originates in infancy as the result of inflammatory changes in the walls of the bronchi, associated with their obstruction by mucus, purulent material, inhaled foreign matter, or cicatrization, the tracheobronchitis which occurs in measles, whooping-cough, influenza, and pneumonia of childhood is probably the most common precedent. But the inhalation of infective or foreign matter, the post-operative phenomena of tonsillectomy, the drainage of infected sinuses, inflammatory stenosis, peribronchial pressure from glands, tumours, and fibrosis of the lungs play their part in causation becomes established during adolescence, but may not be discovered until early adult life Sometimes it appears to develop rapidly at any age from early infancy to senility It produces a chronic and trying invalidism in which the offensive feetor of the breath and sputum may play a dominant part, and death may occur from one of its complications—cardiac failure, brain abscess, copious hæmorrhage, general asthenia, and hypostatic pneumonia The lesions can be spectacularly demonstrated by irrigation of the bronchial tree with lipiodol, but they can be predicted by the expert with reasonable accuracy from the appearances of the radiograph of good technical quality (Plate XXXIV) These appearances include the ill-defined opacities of a slowly resolving pneumonia, recurrent pneumonia, an increase in the lung striæ, and atelectasis, particularly of the lower lobes, features which may be localized to one area (the lower left lobe being the most common), multiple, or general

The possibility of one or more foreign bodies should always be considered in the search. Where operative measures are contemplated further radiography after the irrigation of the bronchial tree with lipiodol is essential, but it must be realized that this injection of lipiodol is not without danger. Death has resulted from inspiratory spasm. By this means saccular, cylindrical, or fusiform types may be distinguished. Visualization of localized areas of the bronchial tree is misleading, for by contrast the remaining areas appear strikingly healthy—more complete irrigation of the lung with lipiodol may reveal a much more extensive distribution of the dilated bronchi

K Kornblum,<sup>2</sup> in a paper entitled "A plea for the prevention of bronchiectasis", states that "the general medical profession is not aware of the prevalence of bronchiectasis, nor does it appreciate the significance of this disease. In his opinion no specialist in the practice of medicine has a better opportunity to view the disease in all its stages and varied aspects than the radiologist, for to him patients of all ages and conditions are referred for investigation.

The attack on the problem lies in prevention rather than cure, and is therefore essentially a serious matter for the general practitioner, because by the time the case reaches the specialist the disease is well established and prevention is out of the question. The early lesion may not be associated with definite symptoms. It is to be suspected if there is a history of progressive development of a chronic productive cough which originated in some infection during childhood, a predisposition to frequent 'colds' or respiratory infections, and expectoration of variable and increasing amounts of sputum which may become very feetid. Its occasional hamoptyses may suggest tuberculosis or mitral stenosis. Recurrent bouts of fever, dyspnæa, night sweats, anæmia, and loss of weight and strength may be its other features which suggest tuberculosis

The most important preventive measures consist of Protection of the infant from damp, cold, and infection, with provision of good wholesome food and warm clothing Careful nursing during such infections as the common cold, measles, whooping-cough, influenza to avoid the complications of pneumonia. Incomplete resolution of pneumonia must be prevented; if suspected the chest should be X-rayed, for the radiographic changes persist when physical signs and symptoms appear to have cleared Thorough investigations should be made in all cases when inhalation of foreign material has occurred. Once the condition is detected postural or bronchoscopic drainage should be instituted

Lobectomy or pneumonectomy, formidable procedures in well-established cases of localized bronchiectasis, give a percentage of success with a mortality of 10 per cent, depending upon the skill and knowledge of the surgeon Only about 25 per cent of cases appear to be suitable for surgery For about 30 per cent no treatment offers a hope of cure

In contrast to bronchiectasis the visibility of the lung striæ of the patient with asthma is diminished ( $Plate\ XXXV$ )

Lung Abscess.—A good account of the diagnosis and treatment of lung abscess is given in three papers by T Holmes Sellars, L G Blair, and L. E. Houghton,<sup>3</sup> This co-operative effort by surgeon, radiologist, and physician is a real contribution to the subject. Dr Blair includes an excellent series of radiographs which well illustrates the features mentioned in the differential diagnosis (see Fig. A, Plate XXXVI). He points out that in the diagnosis of the cystic type of bronchiectasis and in chronic lung abscess lipiodol plays no part in the differential diagnosis of lung abscess, as almost always it fails to enter the cavity. T Holmes Sellars emphasizes this, "Bronchography", he says, "is also contra-indicated in most cases in the early stages. The oil is too heavy and thick to pass the bronchial opening, and its residuum will obstruct the radiological assessment of the abscess progress". The recognition of impaired value of radiographs following lipiodol injection is not as universal as it should be

Inhalation Pneumonia from Nitric Fumes.—The inhalation of nitric fumes leads to peri-alveolar and peribronchial inflammatory reaction and the formacution of multiple small opacities which may simulate silicosis, miliary tuberlosis, or metastatic tumours (see Fig. B, Plate XXXVI) In those cases due to nitric fumes the opacities as shown by radiography may clear to a large extent within a week or so of the inhalation, but it is conceivable that the continuous inhalation of this and other dangerous fumes may lead to a more permanent change in the lungs. The writer has seen a diffuse fibrosis of the lungs in a

few soldiers who have returned from active service in Africa, but the patients did not remember the inhalation of noxious material. It may well have occurred while subjected to the gases of near bombardment explosions

M L Camiel and H S Berkan<sup>4</sup> have given a well-illustrated account of the appearances produced by nitric fume inhalation

#### CARDIOVASCULAR ABNORMALITIES

Patent Ductus Arteriosus with Multiple Aneurysms of the Pulmonary Artery.—H R Holmes<sup>5</sup> has published an interesting account of a case which he illustrates with excellent radiographs showing the typical appearances (*Plates XXXVII*, *XXXVIII*) He includes a note on the clinical condition of the patient, a man aged 26, and the post-mortem findings, and discusses the cases which have been recorded in the literature

Right Aortic Arch.—David Eisen<sup>6</sup> has recorded an account of 8 cases types are met with-a less common simple anterior type, and a posterior or retro-cesophageal type After passing over the right main bronchus, the transverse arch takes a turn to the left behind the esophagus It then swings to the right and descends as a rule slightly to the right of the midline the ascending portion of the arch, before it passes over the right bronchus, the left subclavian branches off from a common trunk with the left common carotid and passes to the left in front of the trachea From the anterior surface of the descending arch, after it has emerged to the left from behind the œsophagus. there arises a diverticulum which is joined to the subclavian artery by a short obliterated vessel With this arrangement the trachea and cesophagus are surrounded by a complete vascular ring, the tightness of which presumably determines whether or not compression symptoms will arise. Fluoroscopy. preferably with barium in the esophagus, is essential to the diagnosis easily be missed on flat-film examination. This may account for its alleged The pathognomonic findings are the right-sided shadow of the ascending arch of the aorta, compressing the esophagus and displacing it to the left, and the high transverse arch crossing over the right bronchus, associated with a forward bulging of the trachea and œsophagus over the posteriorly situated transverse arch of the aorta Other findings are absence of the normal aortic knob and an unusually clean-cut appearance of the pulmonic conus region of the heart, due to the fact that the descending portion of the aortic arch is not superimposed on this area

#### SCIATICA

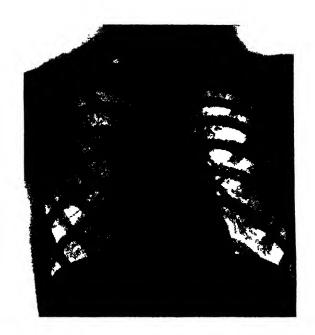
There is probably no problem in clinical medicine which has been the cause of so much controversy as sciatica. It is a problem with many facets, each guarded by a specialty apparently having its limited confines beyond which its disciples appear to be blinded to the light contributed from other sources. Consequently they have no hesitation in claiming the lesion in their sphere to be the commonest cause. The attribution has shown an element of fashion or obsession. Thus a few years ago the inciting cause was attributed to dental sepsis, and those who had had their successes following the extraction of septic teeth have ordered the extraction of the whole of a patient's teeth, though no clinical or radiological evidence of dental sepsis had been found by experienced dental surgeons and radiologists.

Contributing to the difficulty of solving the problem is the loose use of the term 'sciatica'—it may be applied to any pain or discomfort which is experienced by the patient from the lower back to the heel, unilateral or bilateral in its distribution, whether the pain is continuous or intermittent, and whatever its character or severity or variation, and whether accompanied or not by

#### PLATE XXXIV

#### BRONCHIECTASIS

(JAMES F BRAHSFORD)

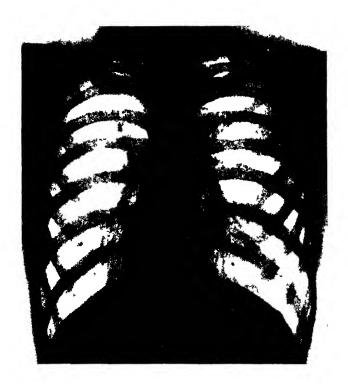


Radiograph of the chest of a boy aged 3 years showing post-pneumonic bronchiectasis in the lower right lobe associated with some thickening of the pleur i

#### PLATE XXXV

#### ASTHMA

(JAMES F BRAILSFORD)



Radiographs of the chest of a box aged 11 years showing the hyper-expansion of the lungs in asthma. Note the relatively small heart shadow and amount of struction of lung. (This picture is reversed )

#### PLATE XXXVI

#### TUBERCULOUS CAVITY MILIARY CARCINOMA

(JAMES F BRAILSFORD)

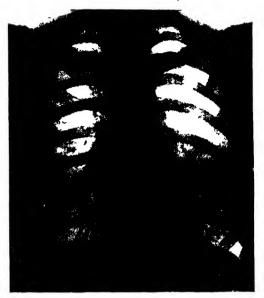
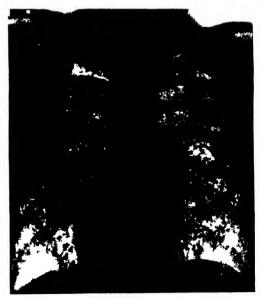


Fig. 1—Radiograph of the chest of a girl aged 10 years, showing an early tuberculous cavity in the left lower lobe. The reaction around the walls and the shadows in the lobe are not so extensive as in the pyogenic abscess



 $^{\prime}$  Fig. B —Radiograph of the lungs of a man aged 45, with miliary carcinoma resembling silicosis and inhalation pneumonia (This picture is reversed )

#### PLATE XXXVII

# PATENT DUCTUS ARTERIOSUS (H R HOIMES)

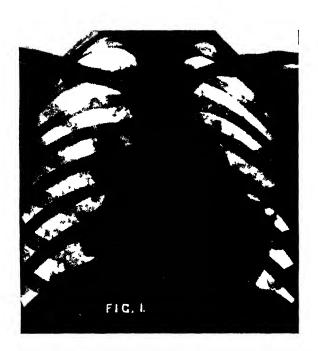


Fig. 1 (Fig. 1) —Radiograph showing the features of a patent ductus arteriosus associated with multiple pulmonary aneury sms and infective endoc irdits

#### PLATE XXXVIII

# PATENT DUCTUS ANTERIOSUS—continued (H R HOLMES)



Fig. B (Fig. 2) —Radiograph showing the features of a pitent ductus arteriosus with multiple pulmon irv. incurvement and infective endocarditis

#### PLATE XXXIX

#### SACRALIZATION OF LUMBAR VERTEBRA

(JAMES F BRAHSFORD)



Sacralization of the right transverse process of the 5th lumbar vertebra with secondary traumatic arthritis in the transverse sacro-iliac joint

#### PLATE XL

#### LOCALIZATION OF FOREIGN BODIES

(JAMES F BRAHLSFORD)

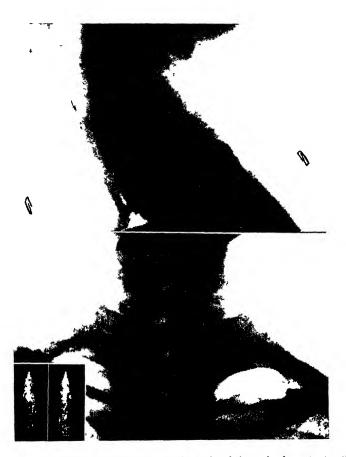


Fig A—Lateral and anteroposterior radiographs of the neck of a patient with metal markers applied to the skin, showing a bullet in the lower cervical spinal canal. The inset shows photographs of the eroded bullet after extraction. It had been within the canal for 2 years, was associated with pain and weakness of the right arm, and had defied numerous attempts at localization and removal. No better instance of the value of anteroposterior and lateral radiographic localization exists. It would be impossible with screening methods, rapid or otherwise, or any method of depth measurement localization to indicate to the surgeon the direction of approach. All the methods tried gave erroneous directions, and previous surgical attempts at removal failed accordingly

#### PLATE XLI

### LOCALIZATION OF FOREIGN BODIES—continued (James F Brailsford)

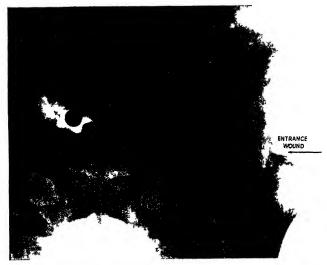


Fig B—Radiograph of pelvis, showing shrapnel bullet in the bladder. It was eventually localized in that viscus, and when removed was coated with urates



Fig. C —Multiple metallic fragments in buttock, none of which were removed MEDICAL ANNUAL, 1945

muscle spasm, rigidity, altered posture or gait, with or without localized tenderness. Some authorities apply the term only to pains in the path or distribution of the sciatic nerve. Some have tried to classify types. The nature of the lesion causing the pain has also been a subject of controversy. By some it is regarded as a fibrositis, with hermation of fat through defects in the fascial covering, by others a permeuritis, an interstitial neuritis, cicatrization of the nerve, a sacro-iliac strain, a lumbosacral arthritis, an arthritis of the lumbar facets, a mal-development, a prolapsed disc. The inciting cause of the lesion has been attributed to trauma, exposure to cold, draughts or damp, a gouty diathesis, a sensitivity to certain foods, and to septic foci in teeth sinuses, gall-bladder, and respiratory or gastro-intestinal tract. But apart from these nervous and skeletal causes other specialists have attributed the symptoms to disorders and diseases of the gastro-intestinal, gento-urinary, and vascular systems.

In each of these specialties and supporting every theory regarding the nature of the causal factor cases have been described, and cures obtained by the many forms of treatment applied. Hurst stated that no matter what the treatmenttrivial needling to drastic manipulation or surgery—the majority would respond to it because the fundamental factor behind each was hysteria. He advised no radiology of the area because it tended unduly to focus the attention of the The radiologist, on the other hand, finds in his museum patient on the site so many examples of developmental (Plate XXXIX), traumatic, or diseased conditions of the skeletal, gastro-intestinal, genito-urinary, and vascular systems which have been associated with the symptoms going under the terms 'lumbago' or 'sciatica' that he is apt to think every case will show radiographic evidence of the cause Actually but a small proportion do this at the first examination -those due to inflammatory changes associated with the bones and joints may In the search for the cause not show any evidence of this for several months a localized lesion in the bone or joint beneath the tender area should not be I have found such lesions when the clinician has perhaps been forgotten obsessed with the idea of some more central lesion, and extensive investigations, even involving drastic surgery, have previously been performed without success To-day attention is focused on lesions of the intervertebral discs which are thought by some to be the commonest cause It has been shown by those who have examined many cadaver spines that lesions in the discs are very common, and Inman and Saunders17 recorded in a recent paper, "It is disappointing, however, in spite of initial brilliant post-operative results, to find a certain proportion of cases presenting a residuum of painful symptoms 
It is now realized that selected cases exhibiting no motor involvement, but in which a disc protrusion or hermation is demonstrable, will improve almost completely with a purely conservative regimen" They emphasize a similar injury to the ligaments around the interpeduncular foramen which is not modified by removal of the disc remnants, and in support of this they quote that the State Corporation Fund of California reports "compensable disability in 100 per cent of patients operated upon for disc injuries"

A Oppenheimer<sup>3</sup>, reporting on a study of 826 cases, states. "Most of the clinical manifestations are caused by these secondary alterations rather than the primary disc lesion 
Even rupture of the disc is not an invariable exception to this rule"

As shown by the reviewer<sup>9</sup> it is certain that once the disc has been severely damaged by injury, degenerative changes occur in it which result in narrowing of the intervertebral space and reactive changes in the approximated surfaces of the vertebral bodies. These changes, which will ultimately be clearly shown by radiography, are associated with definite signs and symptoms. Operative

removal will not prevent the development of these enanges—in fact, they may reasonably be expected to contribute to them since other structures are damaged during the removal. Therefore, in weighing up the merits of surgical removal of disc protrusions, we must consider that radiology can demonstrate other causes, that specialists in a number of other spheres, i.e., gastro-enterology, genito-urinary, and vascular, have their successes in a proportion of cases, we have the evidence of some physicians that the sciatica can be cured by a number of simple procedures because hysteria forms the basis for the continuation of complaints in the majority of cases, and that sciatica is a temporary phenomenon which never occurs twice in the same limb

(See also CHRONIC 'RHEUMATIC' DISORDERS-SCIATICA)

#### MISCELLANEOUS

The Localization of Foreign Bodies.—In a recent leading article<sup>11</sup> it was stated "In earlier campaigns in this war it was common for forward surgeons to have to operate without the assistance of X rays, and it was surprising how often the fragment could be felt and recovered. Without X rays wounds near joints, of the buttock, and of the abdomen were a great anxiety, though the resulting harm was more often to the surgeon's peace of mind than to the patient's wound To-day most field surgical units have X-ray facilities to produce those rough plates which are all the forward surgeon requires." The significance of these statements needs far more attention than has been given to them

Are the rough plates all that the forward surgeon requires? The writer has been so impressed by the many unnecessary failures (involving in some cases up to 5 hours of exploration) and all that they have meant to the surgeon and patient, that he considers rough work entirely unjustifiable. He is of the opinion that the surgeon should be given all the help which radiology can give, but that rough work may so unbalance clinical judgement that the surgeon would be better without

Radiology having as its essential feature expedition may save the time of the radiologist, but materially adds to the surgeon's difficulties and the patient's risks. There is only one way to estimate the value of localization, i.e., the time taken by the surgeon to extract the foreign body. Five minutes of the radiologist's time resulting in the waste of 1 to 2 hours of the surgeon's time, bears no comparison with an operation time of 5 minutes and 1-2 hours spent in localization, not that it is ever necessary to spend anything like the latter to secure accuracy and all the necessary data for prompt removal

The reviewer points out that the essential conditions for this purpose are (1) Two radiographs, one taken with the X-ray tube vertically over a metal marker on the skin so that the central X-ray is in line with the foreign body, and one with the tube horizontal to the table top with another marker in the same plane as the central ray and the foreign body. Both radiographs must be taken without any movement of the patient (Plate XL) (2) Co-operation of the surgeon and the radiologist. The position of the patient during localization must be accurately reproduced on the operating table and the radiologist should preferably be responsible for this, or he should state it definitely in his report and give the relative position of the foreign body to any adjacent bony feature. While the responsibility of the localization rests with the radiologist he should not be expected to bear this unless he receives full co-operation from the surgeon, who will derive very considerable benefit. The patient will profit by the short time of the operation and the minimal damage to his tissues.

All wounds should be radiographed failure to do so has resulted in very large objects being left behind. The shadow of a gas bubble (not to be mistaken for air forced in) may indicate the presence of a non-opaque foreign body

contaminated by anaerobic organisms. It should be accurately localized for the surgeon, for even a so-called gas-abscess may be missed without this aid. Such radiographic evidence of gas should determine the exploration for a metallic foreign body no matter how small. Size in itself may be no indication for the extraction of a foreign body—most sterile foreign bodies give rise to no trouble (*Plate XLI*). Further details and reference to other work is given in a paper by the reviewer <sup>12</sup>

Trauma and the Development of Metastases.—The claim is frequently made that following an injury a bone tumour has developed, and, as such claims are more frequently made in adults of middle and late middle life, the tumours are more commonly found to be secondary carcinoma. In the majority of cases the trauma draws attention to what was previously a painless lesion—a radiograph taken soon after the injury would enable the experienced observer in many cases to say that the injury, perhaps fracture, was at the site of a preexisting lesion It may not be easy to say this if radiography is postponed for some weeks or months The writer has seen many cases where the evidence of a pre-existing lesion existed, but he has seen a number where the bone at the site soon after the injury showed no departure from the normal bone adjacent to it, but radiographs some weeks or months after have shown the typical appearances of neoplasm It is impossible to say that an early metastasis which was still invisible was not developing at the time of the injury, but we have seen inflammatory lesions, pyogenic, tuberculous, and syphilitic, develop at the site of trauma, and it is reasonable to believe that tumour cells circulating in the blood could also settle out in the injured tissue Certain authorities, Segond, Ewing, and others, have suggested that in determining the probable relationship between injury and tumour, the following requirements should be fulfilled .

- 1 Establishment of the injury with moral certainty
- 2 Presence of demonstrable tissue changes caused by trauma (laceration, fracture, etc.)
- 3 Exclusion of pre-existing neoplasm with the aid of physical and radiographic examination
- 4 An interval of reasonable length between the trauma and the first appearance of the tumour
- 5 Presence of so-called "bridging symptoms", i.e., the symptoms of the injury should be continuing with those of the neoplasm
  - 6 The presence of the tumour at the point of the trauma
- 7 Definite establishment of the diagnosis of a neoplasm. The writer has pointed out that the patient may not remember receiving the trauma injuries sustained during the excitements of pleasure, passion, or danger may not be remembered. The discovery of bruises or hæmatomata without any remembrance of the injury causing them is common
- B J Toth<sup>13</sup> has published an interesting account of a case in which a tumour developed at the site of a fracture through apparently normal bone

The Value of the Barium Enema in the Diagnosis and Treatment of Intussusception in Children.—Reduction of intussusception in children with a barium enema under visual control has been increasingly used. Nordentoft<sup>14</sup> records that while in 1928 it was used in only 10 per cent of all the cases, in 1935 it was used in 90 per cent. His work is based on the analysis of 440 cases, 202 of which were examined by barium enema. He classifies them as small-bowel forms, enteric or ileocolic, 128 cases, large-bowel forms, colic and ileocæcal, 298 cases. Ileocolic combined with ileocæcal he calls compound ileocolic

In very young children late passage of blood from the bowel he regards as an indication of intussusception of the small-bowel type. As it has a bad

prognosis the case should be sent to hospital on suspicion and investigated The condition presents five cardinal symptoms (1) pain, (2) vomiting, (3) blood in stools, (4) tumour in abdomen, (5) invagination figure seen on X-ray examination Details of the technique of the barium enema, the criteria of reduction, elements of danger, and results of treatment are described

Localization of Placenta.—R M Smith<sup>15</sup> considers that radiographs taken with soft-tissue technique show the position of the placenta in the majority of cases. In those cases when its shadow is obscured by the bones of the pelvis the position of the fœtal head will give an idea of the whereabouts of the pelvic placenta. Such demonstration is to be preferred to the use of contrast media.

Pheniodol.—The new contrast medium for demonstrating the gall-bladder has certain advantages over the older media. Put on the tongue in crystal form it can be swallowed with the aid of a drink of water without any unpleasant taste or sensation. Usually it produces none of the accompaniments, such as sickness or purgation, which were formerly common, and the opacity of the bile-filled gall-bladder 12–16 hours after taking the dye is perhaps even better for radiographic visualization. In an account of his researches with this new drug, F. H. Kemp<sup>16</sup> gives an appreciation of the value of this investigation.

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#### RADIOTHERAPY.

M C Tod, FRCSE, F.FR Ralston Paterson, MD, FRCSE, FFR

#### MALIGNANT DISEASE

Organization.—The articles on radiotherapy published during 1944 have been less numerous and less important than those of preceding years, but there is one publication which may, in years to come, prove to have a most important influence on the development of radiotherapeutic technique is the booklet of instructions recently issued by the Ministry of Health, together with registration and abstract cards, for the use of all hospitals participating in schemes approved in connexion with the Cancer Act These cards and booklets have been prepared by the Radium Commission and will be given their first trial in the Commission Centres The choice of the Radium Commission, which for years has been collecting statistics of the results of radiotherapy, to initiate this important scheme for the registration of all cases of cancer applying for treatment, shows how important is the part which radiotherapy now plays in the treatment of cancer Surgery naturally remains the only method of treatment in some forms of cancer, and shares in the treatment of others, but radiotherapy is no longer regarded as a palliative treatment in advanced cases or a doubtfully helpful supplement following surgery, but as an equal partner It is the need for specially equipped centres for radiotherapy which has placed those hospitals selected as Radium Commission Centres in a position to undertake the registration of all cases of cancer referred to them, and they provide the pattern of a scheme which will finally be extended to every hospital in this country where cancer is treated importance to radiotherapy of the statistical analysis which large numbers of accurate clinical records will make possible is obvious, the value of existing methods of treatment can be assessed and the effect of new methods can be determined more quickly than when numbers were small and it was necessary to wait until enough cases had accumulated to provide significant figures

#### Methods of Treatment in various Malignant Conditions.—

Cancer of the Kidney and Urinary Bladder—The treatment of these conditions has been the subject of several interesting reports. A Jacobs² describes the treatment of 93 cases which were selected for radium implantation from 400 cases of carcinoma of the bladder treated over 9 years. The type of case best suited for implantation is the broad-based non-villous carcinoma in the lower zone of the bladder, but some ulcerated and nodular growths were also treated. A suprapulic extra-peritoneal cystotomy was performed under spinal anæsthesia, the fungating mass removed with diathermy, and the base implanted as a single plane either with needles containing 1 mg. Ra. E. or with radon seeds. The dose is 7000 r in from 120 to 200 hours according to the size of the lesion. Of the 93 cases, 41 are alive, 31 with a tumour-free bladder, 10 clinically well but not recently cystoscoped. The period of survival is not given.

C C Herger and H Sauer<sup>3</sup> discuss the reactions which follow the use of radon implantations for carcinoma of the bladder. They treated 279 cases, of which 229 were available for study; 50 had radon only, in others implantation was combined with diathermy or a radium pack. Of 114 cases treated from 1930 to 1935, 31 6 per cent lived 5 years, 29 cases had persistent ulcers without obvious tumours, but of these only 5 are alive and well. The doses are given in millicurie-hours so no accurate assessment of biological effect is possible. The description of the ulcers suggest that they were a local high dose effect due either to incorrect distribution or to actual overdosage. The satisfactory survival-rate may be considered to justify the risks taken

The same authors<sup>4</sup> analyse 100 consecutive cases of cortical kidney tumours. They quote J T Priestly,<sup>5</sup> who in 1939 analysed 395 similar cases and concluded that there was no significant difference in the survival rates of patients who had post-operative X-ray therapy and those who had none. They argue that post-operative therapy seemed to make little difference. In cases where removal of the tumour was impossible, tumour doses of 3000 to 4000 r obtained no more than temporary regression, and in most cases there was no appreciable response. This is an interesting negative finding which it is difficult to challenge, and most radiotherapists will agree that the ladical treatment of cortical tumours of the kidney in adults is surgical, with radiation of doubtful value even for palliation.

One kidney tumour must, however, be excepted, and that is the Wilms tumour of the kidney found in children E W Rowe and M D Frazer<sup>6</sup> treated 4 cases 1 had a nephrectomy followed by X-ray therapy but died within a short time, 3 had pre-operative X-ray therapy, nephrectomy, and post-operative therapy, and are alive after 4 years, 2 years, and 7 months. This is a rare tumour and one until recently almost invariably fatal. It is, however, highly radiosensitive and can be successfully treated by X-ray therapy and nephrectomy, therefore its recognition and correct treatment are important. Post-operative X-ray therapy is ineffective if an attempt to remove the large neoplasm has scattered malignant emboli, so clinical diagnosis is essential and is confirmed by marked radio-sensitivity

Retino-blastoma (Neuroblastoma or Ghoma Retinæ)—This is another interesting tumour found in children, the treatment of which is discussed by G M Tice and E. J. Curran. They believe that, although the tumour is malignant and infiltrates locally, the tendency to produce metastases is not great. There is, however, an unfortunate tendency to involvement of the other eye Radiation is required because removal is often incomplete, and to preserve the sight of the other eye Twenty cases were treated, half of them bilateral, the method was a combination of surgery and radiation, 7 patients are alive, and

3 of those who had evidence of bilateral spread have sight in the remaining eye, the eye affected having been enucleated

Carcinoma of the Lung—R C Brock<sup>8</sup> discusses the treatment of cancer of the lung by pneumonectomy or lobectomy, and gives a table (*Table I*) analysing the cases seen from January, 1941, to September, 1943.—

Table I.—OPERABILITY OF BRONCHIAL CARCINOMA

Total cases	224			
Thoracotomy advised	40			
Thoracotomy accepted	86	(16	per	cent)
Inoperable at thoracotomy	18		_	
Removal of growth	18	(8	per	cent)
Died from operation	8	-	-	
Inoperable	206	(92	per	cent)

A further table (Table II) shows what happened to every case of lung carcinoma on which he personally had operated —

Table II —RESULTS OF OPERATION FOR BRONCHIAL CARCINOMA

Total cases	82 (3 lobectomies)
Died from operation	9 `
Died from recurrence	8
Alive and well	15

For comparison with the surgical results J. L. Dobbie<sup>9</sup> described 170 cases treated by X-ray therapy. Of these, 111 were so advanced that the treatment given was purely palliative, 59 cases had radical treatment with small-field beam-directed X-radiation. The results of the radical treatment are shown in Table III.

Table III —RESULTS OF 59 CASES OF BRONCHIAL CARCINOMA TREATED RADICALLY BY X RAYS (11 CASES LIVING)

CASE	ALIVE AT	Historogy	Condition
1	6 years		Well
2	5 years	Squamous	Well
8	31 years	Squamous	Recurrent
4	2 years	Squamous	Well
5	14 years	Oat cell	Well
6	1 year	Anaplastic	Well
7	1 year	<u> </u>	Well
8	1 year		? Cerebral metastases
9	10 months	Squamous	Well
10	10 months	_	Well
11	9 months	_	Recurrent

B P Widmann<sup>10</sup> reports a series of 167 cases of bronchiogenic carcinoma Untreated cases died as a rule in less than a year. Of the irradiated cases 18 lived from 1 to 6 years and there was also some palliation shown by a rather longer period of survival when treated cases are compared with untreated cases.

Malignant Tumours of the Upper Jaw —These were the subject of the Skinner Lecture by B. W Windeyer<sup>11</sup> This comprehensive paper deals with every aspect of the subject, and is particularly valuable because it describes and illustrates some of the field arrangements used for radium beam and X-ray therapy of a site which presents many difficulties Table IV shows the results obtained

Tumours of the Salwary Glands.—This was the subject of discussion by the Therapy Section of the Faculty of Radiologists at the Annual Meeting in

1943 R T. Payne<sup>12</sup> discussed the different types of tumours found in the salivary glands, and decided that the best result in the common mixed salivary tumour is obtained by a combination of surgery and radiation M C Tod<sup>13</sup>

	TOTAL	TREATED	Symptom-free	SYMPTOM-FREE
			8 years	5 years
Carcinoma-			- g	1 5
1925-1937	94	82	28	17
			(28 per cent)	(20 7 per cent)
1925-1935	81	69	18	13
		1	(26 per cent)	(18 8 per cent)
With present technique		-		
1936-1937	18	18	Б.	4
1986-1939	30	80	11	
2000 2000			(86 6 per cent)	£
Sarcoma				
1925-1937	10	9	1	1
			-	(fibrosarcoma of relatively low malignancy)

 $Table\ IV$  —Results of Treatment of Malignant Disease of the Upper Jaw by Radiotherapy

argued in favour of excision plus immediate radium implantation of the bed from which the tumour has been removed  $Table\ V$  shows the results of this method of treatment in mixed tumours of the parotid

Table	V —RESULTS	OF TREATMENT	BY SURGERY	AND RADIUM
	of Mixed T	UMOURS OF TH	E PAROTID G	LAND

CASES PRIOR TO 1940	J-YEAR RESULTS	5-year Results
Number treated	72	52
Number well without re-treat- ment Number well following re-treat-	68	48
ment of recurrence Number recurrent	2 2	3 1
Percentage well	97	98

When tumours of the parotid are malignant, operation is usually contraindicated by fixation and they are treated by radiation alone. The prognosis
is poor except when the tumour proves to be a lymphosarcoma. Tumours of
mixed salivary type in other sites are also treated by a combination of surgery and radiation, but they have a greater tendency to become malignant,
and therefore a worse prognosis than mixed tumours of the parotid. To be
effective, irradiation must deliver a dose lethal to this tumour of limited
sensitivity, but if correct dosage levels are reached, recurrence after surgery
combined with radiation is much less likely than after surgery alone. M
Lederman¹⁴ recommends the same method for mixed-cell tumours, but
believes that radium beam therapy offers special advantages in tumours of
large size or believed to be malignant. Careful beam direction is necessary
to deliver the dose to the required zone

Carcinoma of the Larynx.—X-ray treatment of carcinoma of the larynx is discussed by J V Blady and W E Chamberlain<sup>15</sup> The cases reviewed were treated between 1931 and 1937, and during this period the technique developed from open fields to small fields using applicators The paper is of interest

because it is one of the first from America which records the use of radiography to determine beam direction, thus showing that this method, already well developed in this country, is now receiving wider attention. Unfortunately, in discussing the dosage received, needless ambiguity arises from a confusion of r in air, total tumour dose, and threshold erythema dose. Doses appear to be of the order of \$500 r or more in a minimum of 24 consecutive days, 13 out of 23 cases of intrinsic and 3 out of 13 cases of extrinsic cancer of the larynx survived five years

Another method of treatment, the Finzi-Harmer, employed for intrinsic cancer, is considered from the point of view of dose distribution by G. Morton, L. H. Gray, and G. J. Neary <sup>16</sup> They used normal larynges fixed in formalin which were fenestrated and implanted with radium. The typical Finzi-Harmer arrangement and a modification which removes the lower border of the thyroid cartilage and the upper part of the cricoid ring were investigated. Very careful measurements of the distance involved were the basis of calculations which were confirmed by direct measurements with small ionization chambers. These showed that the field of radiation is very limited, only the middle of the vocal cord being irradiated to an adequate level with the doses usually given. The needles tend to be rather high up so that the subglottic region escapes treatment. Various modifications are designed to increase the area treated to full dosage.

Polycythæmia —The irradiation of large parts of the body for polycythæmia is a development of technique discussed by L L Robbins<sup>17</sup>; 20 cases were treated at the Massachusetts General Hospital during a ten-year period. The whole trunk from the neck to the knees was treated with doses beginning with 20 r and increasing to 50 r. The total course gave from 200 to 1200 r, the average being 500 to 600 r. Alternate anterior and posterior fields were treated. Frequent blood-counts were made, and treatment was stopped if the white count fell below 4000 per c c. Sixteen of the 20 cases did well with long remission, 10 were well after periods of from 6 months to 4½ years, 6 were alive but had symptoms related to the disease. Most of the 20 had further treatment after the first course.

#### RADIATION REACTION

Considerable attention has been directed to the treatment of the symptoms produced during and after radiation. W. B. Bean, T. D. Spies, and R. W. Vilter<sup>18</sup> have made a study of irradiation sickness and the accompanying abdominal symptoms which complicate irradiation of the upper abdomen. There are analogies between roentgen sickness and certain dietary deficiency states, particularly pellagra. Sixteen subjects were chosen for study, some nutritionally normal, some pellagrin, and some showing slight vitamin-B deficiency. They were all given 400 r to the upper abdomen in one exposure. Those on good diets or receiving extra vitamin B showed little or no ill effects, those with definite deficiency nearly all showed severe reactions. The conclusions drawn are that vitamin therapy is preventive rather than curative, and that during treatment it has little effect but should still be used to improve nutrition.

 $\tilde{E}$  L. Jenkinson and W H Brown<sup>19</sup> discuss the mechanism by which irradiation sickness is produced, and suggest the use of amphetamine and d-disoxy-ephedrine for prophylaxis. They also advise the use of water-soluble vitamins.

D Goldman and J E. Robertson<sup>20</sup> have investigated the metabolic changes resulting from roentgen therapy and have compared the effect of 200 kv and 1000 kv. from this point of view They found no significant variation of basal metabolism, but there are changes in nitrogen metabolism indicating protein

breakdown There are interesting fluctuations in chloride metabolism, sodium chloride starvation being associated with sickness. A negative chloride balance was more frequent with 200 kv than with 1000 kv. The authors, however, believe that the chloride metabolic changes are secondary to a disturbance in the water balance, and not the precipitating cause of irradiation sickness.

J E Leach<sup>21</sup> has made a long study of the effects of roentgen therapy on the heart, 84 patients in three groups were studied, one group in which the mediastinum was not irradiated, but lesions in other parts of the body were treated, one in which the mediastinum was treated together with other parts but to low dosage, and one where the mediastinum received full dosage. He concluded that there is no evidence that the heart is affected by roentgen therapy as used at present. The depression of blood-pressure seen during and after radiation is a secondary effect.

Skin reactions were investigated by J B Herrmann and G T. Pack <sup>22</sup> They tested the sensitivity of different skin areas, and found that the axilla and groin are the most sensitive, hands and feet the least sensitive, but the dorsum more than the palm and sole. Other areas he between. These findings are a little surprising when the danger of late radiation reaction on dorsum of hand and foot is remembered, but erythemas have been studied here, and the degree of immediate reaction cannot be taken as an index of the degree of late effect.

A A Charteris<sup>23</sup> has found sterile sulphanilamide powder on dry gauze a useful dressing for the severe skin reaction necessary for radical treatment. It is sometimes desirable first to cover the part with a protective gauze tissue which is allowed to dry on and remain in position, the sulphanilamide powder being dusted on and renewed at intervals

These papers on reactions leave an impression that the best way to avoid them is scrupulous care in prescribing dosage, together with the use of beam direction or tangential fields to avoid irradiating more tissue than is really necessary, rather than elaborate medication to relieve symptoms during treatment

#### BENIGN CONDITIONS

Infections.—Little new work has appeared Acute infections continue to be treated by very small doses of X rays, but chemotherapy has reduced the number of cases which require radiotherapy.

Tuberculosis, a disease which has greatly increased under present conditions, is attracting attention R Rosh and W P Quinn<sup>24</sup> report on 419 patients treated for tuberculous cervical lymphadenitis from 1924-to 1941. In 305 cases there were positive biopsies Low or medium voltage was used, 100 r per treatment at weekly intervals to 600–800 r, with a second course after 8 weeks. The end-result showed complete disappearance of the lesion in 198 cases, partial disappearance in 101, slight improvement in 31, and in 9 cases there was increased activity of the disease

H C McIntosh<sup>25</sup> remarks on the numerous publications regarding pelvic tuberculosis in the female in the German literature compared to the scanty references to this form of the disease in America. At the Women's Hospital of New York only 94 cases of pelvic tuberculosis were seen out of a total of 27,160 gynæcological admissions for 1929–42 The doses, at first 300 r per exposure, are now 75–100 r at weekly intervals Of 11 cases treated, 6 are apparently well 1 to 3 years after treatment, 4 improved, 1 died of pulmonary tuberculosis.

The treatment of arthritis by radiation is still on trial T. Horwitz and M. A Dillman<sup>26</sup> have investigated the effects of X rays on certain non-specific articular lesions and have also irradiated experimentally the normal joints of dogs. They do not claim that X-ray therapy has been proved to benefit

certain arthritides, but believe that it has been found valuable in the control of joint effusion. Six cases (8 joints) were treated with X rays from two parallel fields. The average dose given, once weekly, was 200 r, continuing to a maximum of 8000 r given in two courses. All effusion disappeared and movements became normal.

Experiments with dogs proved that doses as high as 8000 r could be given to normal joints with fields and courses similar to those used for human subjects without producing appreciable changes when the dogs were killed for examination after periods running into several years

A development in the radiotherapy of skin diseases is the use of thorium X, a source of alpha rays. It is applied in alcohol or varnish and affects the surface layer of the skin only. H Corsi<sup>27</sup> has found it of value in the treatment of alopecia areata and psoriasis, and believes that it will prove effective in subacute and chronic dermatitis and possibly in ringworm of the nails and sycosis. In selected cases of capillary nævi it is invaluable, but it is useless in the treatment of other forms

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#### RECTUM, CARCINOMA OF.

W. B Gabriel, MS, FR.CS

Surgical Treatment.-F A Coller and H K. Ransom<sup>1</sup> have summarized their results in the treatment of cancer of the rectum over a 12-year period. Biopsy was done in all cases, they consider that no harm and many advantages accrue from a carefully performed biopsy, particularly by revealing inflammatory lesions, lymphomas, endometriosis, etc., and thus sparing the patient a mutilating operation Out of 508 patients, 223 were considered to be unsuitable for radical surgery Colostomy only was performed in 144 cases, with an operation mortality of 174 per cent Radical resections were performed in 285 cases (561 per cent of the total) Combined abdominoperineal excision was done in 274 cases, or 96 per cent of the resections tomy and posterior resection was employed in only 9 cases, and in 2 cases a high colostomy was done, followed by a conservative perineal excision, both of these cases developed recurrence within a year. Emphasis is placed on many details of pre- and post-operative treatment. Stainless steel wire is recommended for closing the abdominal incision, and the colostomy is left long, pending 'trimming' to 5 cm. later. The mortality for one-stage abdominopermeal excision was 89 per cent Surgical diathermy, X rays, and radium are to be regarded as forms of palliative treatment 'The authors believe that in the future better results will come from earlier diagnosis and treatment. and the prevention of complications such as pulmonary embolism, wound sepsis, and genito-urinary complications

A smaller series is reported by J W Baker<sup>2</sup> his paper covers 99 cases of carcinoma of the rectum and rectosigmoid, the operability-rate being 66 per cent. Abdomino-perineal excision was the method of choice and was done for 49 cases, with only 1 death. Sulphasuxidine or sulphaguanidine were not given pre-operatively, but the author now uses a combination of sulphathiazole and sulphanilamide powder locally between the omentum and parietal peritoneum, also in the abdominal and perineal wounds. During the last 18 months he has done some anterior resections for low pelvic colon growths with primary

open anastomosis of the colon to the rectal stump, and various details in technique are reviewed

The difference in practice between British and American surgeons on the one hand, and Continental surgeons on the other, is shown by the report by R von Oppolzer and L Nitsche This deals with a series of 407 cases of rectal cancer seen at the First Surgical Clinic of Vienna during the years 1926-40. Radical operation was carried out in 209 cases, equal to 513 per cent-these comprised 105 sacral extirpations, 63 sacral resections, 4 abdominal resections, and only 37 one-stage combined operations. Over the entire period the mortality after combined excision was 45 per cent, but in the last 5 years the mortality fell to 20 per cent. Peritonitis, sepsis, and pneumonia were the chief causes of death after radical operation. In 20 per cent of the fatal cases after radical operation, metastases were proved to be present at the time of operation. The 5-year survival-rate after radical operation was 19 per cent. Colostomy alone was done in 30 per cent of the cases and carried an immediate mortality of 20 per cent.

H C Saltzstein and J Kelly have described 4 cases illustrating certain problems and complications in the surgery of carcinoma of the left colon and In one case, after a Devine type of defunctioning colostomy, an anterior resection of a growth in the recto-sigmoid was carried out by the open method, later, however, a constricting carcinoma was discovered at the splenic flexure and this was removed by Rankin's obstructive resection, the two colostomies being closed in due course. In another case following abdomino-perineal excision for a rectal carcinoma, an organic obstruction developed, which laparotomy on the fifth post-operative day proved to be due to adhesion and obstruction of a loop of small intestine at the upper end of the pelvic peritoneal closure. This was known to have been sutured under slight tension, and owing to subsequent separation of the peritoneal edges a raw surface had developed The various vicissitudes of the patient subsequently, until his final recovery, are clearly described; both Levine and Miller-Abbott tubes were required, also an enterostomy, and throughout a long and anxious three weeks the usual problems of fluid balance and blood chemistry (particularly in regard to chlorides and proteins) received skilled and devoted attention

Pathological Aspects.—P H. Seefeld and J. A Bargen<sup>5</sup> report the results of a study of 100 specimens of rectal cancer removed by the abdomino-perineal or the abdominal route at the Mayo Clinic in 1985-6 Lymphatic involvement was present in 47 per cent of the 100 cases The incidence of lymphatic metastases was highest in the case of grade 3 and 4 carcinoma (75 per cent), and in young subjects, in the age-group 20-39 there was 63 per cent of lymphnode involvement, falling to 50 per cent in the age-group 40-59, and to 28 6 per cent in subjects between 60 and 79 years of age Invasion of nerves was demonstrated in 30 out of the 100 specimens, and in the majority of the positive cases (89 per cent) pain had been a prominent symptom There was a striking incidence subsequently of local recurrences in those patients with proved permeural invasion (812 per cent), compared with only 304 per cent of local recurrence in those without perineural invasion, and in the group of 29 traced cases with perineural involvement only 2 patients were alive and well five years after operation. There was invasion of veins in 20 out of the 100 specimens, and in a high proportion of these (94 per cent) visceral metastases in the liver were either present at operation or developed later; in noticeable contrast to this was the finding that of the remaining 80 cases which failed to show invasion of veins visceral metastases occurred in only 15 (187 per cent). The bad prognostic significance of venous involvement when found is therefore evident. All three types of extra-rectal involvement, lymphatic, perincural, and venous, were found most frequently in the higher grades of malignancy, as shown in  $Table\ I$ 

Table I —INCIDENCE	OF NODAL,	PERINEURAL,	AND	VENOUS	Invasion
		of Malignan			

GRADE	TOTAL CASES		Nodal Involvement				Venous Involvement	
	CASES	Cases	Percentage	Cases	Percentage	Cases	Percentage	
1 2 8 4	14 54 24 8	8 20 18 6	21 4 37 0 75 0 75 0	2 16 9 3	14 3 29 6 37 5 37 5	1 7 7 5	7 1 13 0 29 2 62 5	
Totals	100	47		30		20		

In a presidential address, C E Dukes has discussed various aspects of the surgical pathology of rectal cancer From examination of more than 1000 operation specimens, spread into the superior hæmorrhoidal vein or its tributaries was found in 17 per cent A very convincing correlation was found between the histological grade of the primary tumour and the percentage of venous spread, as shown in Table II

Table II —Influence of Histology of Tumour on Incidence of Venous Spread

GRADE OF PRIMARY TUMOUR	Number of Cases	PERCENTAGE WITH VENOUS SPREAD
1	81	4 9
2	442	11 8
8	179	25 4
4	19	31 6
Colloid	107	19 5

The presence of demonstrable growth in the hæmorrhoidal vein does not necessarily imply that metastasis to the liver has taken place, and post-mortem examination of recent operation cases revealed hepatic metastases in exactly half the cases with proved venous extension. Detachment of malignant emboli to the liver is more likely to occur when massive growth has formed inside a large vein, and if the patient survives operation the prognosis as regards lengthy survival is distinctly poorer than in cases without venous spread. There is a much greater liability to lymphatic metastases in the higher grades of malignancy metastases were only rarely found in well-differentiated growths of a low grade of malignancy, but were almost invariably present in the rapidly growing anaplastic tumours. An analysis of 1262 cases enabled Dukes to present a table (Table III) which shows the importance of routine grading as an aid to prognosis.

An inquiry into the number of involved lymphatic glands showed that the prognosis after excision of the rectum was distinctly worse when many glands were invaded, and Dukes formulated the following useful generalization which it is easy to remember patients with one to three lymphatic metastases often survive for 5 years or more, but patients with five or more glands rarely live for 5 years.

On investigating the end-results after excision of the rectum for cancer, Dukes found that about 40 per cent of cases treated were alive after 5 years. Of the 60 per cent who died, it is calculated that 10 per cent died of other causes, thus giving a recurrence rate of 50 per cent over a 5-year period. Once the 5-year mark has been reached, Dukes finds that the expectation of life of a patient after excision of the rectum is as good as that of any other person of a similar age. In comparison with this, the prospects after palliative colostomy for inoperable rectal cancer are very poor, out of 492 cases studied, more than half the operation survivors died within 12 months, 3 lived for 5 years, and

PERCENTAGE TUMOUR NUMBER OF WITH LYMPHATIC GRADE CASES METASTASES 101 168 42 5 3 286 738 Colloid 158 72 1

Table III —RELATION OF LYMPHATIC METASTASES TO HISTOLOGICAL GRADE OF TUMOUR (1262 CASES)

none survived to the sixth year After radical excision of the rectum when the cases have been grouped into A, B, and C cases according to the depth of spread (Dukes' classification), it was found that there was not much difference in the results in the A and B cases whether treated by perineal or combined excision, but in the C cases (lymph-nodes involved) combined excision had a definite superiority over perineal excision amounting to 13 per cent after 5 years this figure is likely to increase as time goes on, and there is no doubt that the much improved operability-rate of rectal cancer is due to the more general adoption of the combined operation

REFERENCES — Surg Gynec Obstet 1944, 78, 304, Ibid 79, 92, Arch klin Chir 1942, 203, 159 (abstr Surg Gynec Obstet 1944, 78, 34), Surg Gynec Obstet 1944, 79, 27, Ann Surg 1943, 118, 76, Proc R Soc Med 1944, 37, 131

#### RENAL DISEASES. (See also KIDNEYS)

Sir Henry Tidy, M.D., F.R.C.P. G W. Thorn, G F Koepf, and Marshall Clinton<sup>1</sup> (Boston and Buffalo), under the title renal failure simulating adrenocortical insufficiency, publish the study of two cases of great interest and importance. The hormone of the adrenal cortex aids in the maintenance of a normal state of hydration by increasing the renal tubular reabsorption of sodium chloride and water, and in its absence, as in Addison's disease, excessive sodium chloride and water are eliminated by the kidneys, resulting in dehydration, hypotension, and ultimately collapse Theoretically, the authors point out, a type of renal tubular damage might occur which would prevent the adrenocortical hormone from exerting its usual effect and thus produce a condition simulating Addison's Hypochloræmia and dehydration are known to occur in uræmia without cedema, but the authors are recording, apparently for the first time, two cases with a clinical picture of a shock-like state presenting signs and symptoms indistinguishable from those of acute adrenal insufficiency occurring in patients with chronic nephritis and normal adrenal glands. Both patients were young adults without clinical evidence of previous renal impairment, and both were admitted in a state of collapse with hæmoconcentration, dehydration, and hypochloræmia. The urine contained no protein or deposit,

and they were considered to be suffering from acute adrenocortical insufficiency They were treated accordingly with sodium chloride and glucose, and intravenous administration of adrenocortical extract. Dramatic improvement followed, the plasma volume and blood-pressure being restored It was found. however, that azotæmia was present and persistent, and kidney-function tests revealed high-grade renal insufficiency Ultimately it was shown that whereas sodum chloride and water were life-saving, adrenocortical preparations were of no value The symptoms some weeks before admission were weakness, nausea, and vomiting. In one case muscular twitchings had occurred In neither case was there any abnormal pigmentation, and both showed hypoglycæmia They were able to return home taking 25 g. of sodium chloride daily by mouth. They lived fairly comfortable and active lives for two to three years, but the blood-urea nitrogen steadily rose, and the renal function tests showed increasing deficiency 

Œdema then developed, and the sodium Both died in uramia At autopsy the kidneys chloride had to be reduced were shrunken, with little remaining parenchyma, in a condition of advanced chronic nephritis The adrenals were normal. The authors believe that this clinical syndrome is probably not associated with a typical pathological lesion in the kidney, but rather occasionally occurs late in the course of insidious, slow, but progressive renal disease. For a period there is a precarrous balance in which a small excess of sodium chloride is lost daily, but few patients live long enough in this stage to reach the condition of severe dehydration and circulatory collapse

John Marchand and Clement Finch<sup>2</sup> (Boston) record two cases of uramua with renal failure and oligina in which potassium intoxication occurred. The failure in excretion of potassium resulted in an increase in the concentration of potassium in the serum to 98 and 101 milli-equivalents per litre. Serial electrocardiograms showed changes leading to cardiac arrest, including evidence of auricular flutter and progressive delay of conduction in the auricles. These changes are comparable with those previously observed in association with potassium intoxication in dogs and in man. In the first case intravenous injection of a solution of calcium gluconate resulted in transient restoration of regular rhythm. The cessation of respiration in each case was preceded by circulatory failure, and there was evidence that the heart was arrested in diastole.

A C Corcoran, R D Taylor, and Irvine Pages (Indianapolis) studied the immediate effects on renal function of the onset of shock due to partially occluding lumb tourniquets. Changes of renal blood-flow and function during shock are of interest, since they may in a measure explain the pathogenesis of renal failure in 'traumatic anuria' ('crush syndrome') The experiments were performed on anæsthetized dogs The authors conclude that the depression of renal function during the onset of shock due to partially occluding tourniquets is due to a decrease of renal blood-flow which is only in a minor measure the result of decreased arterial pressure. This decrease of renal blood-flow is due almost wholly to increased renal vascular resistance, into which increased blood viscosity enters only in small degree, the increased resistance being due rather to vasoconstriction, predominantly affecting the glomerular efferent Although nervous stimulation causes a small measure of this vasoconstriction, much the larger fraction is independent of the renal nerves, and by exclusion, so the authors believe, of humoral origin. They attribute the vasoconstriction to a "vasoconstrictor substance" appearing in the plasma

R. E Rewell' (Guy's Hospital) investigated the potassium concentration in the blood-stream following ischemia of muscle masses by tourniquets. It is known that concentration of potassium is much greater in cells than in tissue fluids,

the difference probably being 25 times. This great difference in potassium concentration on the two sides of the cell membrane is maintained only so long as this structure remains undamaged, prolonged asphyxia being one method of causing such damage. The investigation was undertaken to determine if any appreciable loss of potassium followed periods of asphyxia in large muscle masses. The subjects were patients to whose limbs tourniquets had been applied for periods ranging from 85 to 100 minutes during orthopædic operations. Blood samples were taken from the antecubital vein just before and at 7 minutes after the removal of the tourniquets. The results are recorded in the appended table—

CASE	DURATION	Position of	SERUM POTASSIUM			POTASSIUM SERUM PHOSPHATE		
No	OF ISCHÆMIA (MIN )	TourniqueT	Before Removal	7 Mins Later	Rise	Before Removal	7 Mins Later	Rise
1	90	Top of thigh	195	22 6	31			_
2 8	50	Below knee	22 2	23 6	14			
8	80	Half up thigh	21 2	27 6	64			
4	50	Top of thigh	186	21 2	26	4.5	52	07
4 5 6	70	Above knee	203	202	-01			
6	70	Above knee	186	192	06			
7	70	Right arm	167	165	-02			
8	45	Below knee	174	187	13			_
9	100	Above knee	171	192	21	54	74	20
10	90	Half up thigh	195	20 0	05	33	40	07
11	85	Top of thigh	169	185	16	32	38	06
12	60	Top of thigh	197	214	17	43	48	0.5

The values for the serum potassium and phosphate are in mg per 100 c e

The observations show a significant rise in serum potassium after the removal of the tourniquet. The author suggests that the extra potassium in the circulation might have come from the cells in the ischæmic area of the liver by action of a hypothetical substance released in the constricted limb. [The suggestion of a substance released from the constricted limb agrees with the experiments in the preceding abstract, and other evidence also exists in its support—H T]

References — 'New Engl J Med 1944, 230, 76 , 'Arch intern Med 1944, 73, 384 , ' Inn Surg 1943, 118, 871, 'Brit med J 1943, 2, 483

#### RHEUMATOID ARTHRITIS. (See CHRONIC 'RHEUMATIC' DISORDERS)

#### SCABIES. R. M B. MacKenna, MA, MD, F.R.CP Life-history of the Parasite, and Method of Spread of Infection.—R M. Gordon, K Unsworth, and D R Seaton have drawn attention to the remarkable fact that in spite of the wealth of investigations concerning scabies, some of which date as far back as the work of F Hebra (1868), there exists no single reliable account of the complete life-cycle of any burrowing mite responsible for the production of scables in man or animals, they allege that it is not known how the infection spreads on the host; or what stages of the parasites are chiefly responsible for the transmission of the disease to a new victim. The first of these statements is certainly correct, the second may be disputed; and the third is sub judice. There appear to be no records of copulation having been observed in sarcoptic mites, and it has been disputed whether this act occurs in the burrows, or on the surface of the skin. Gordon and his co-workers investigated Notoèdres infestation in white rats (Notoedres is a genus of burrowing mite which causes a type of rat scables and which occasionally attacks man) They found that male mites took no notice of

adult females or of nymphs when they were placed near them on the surface of the skin, but when males were placed on an area of skin in which there was a burrow containing an adult unfertilized female, although at first they wandered about on the skin for a short time, they invariably returned to the site of the female burrow, where they commenced to dig down contention on this observation, they suggest that it is probable that in Notoedres fertilization occurs within burrows or moulting pockets in the skin of the host, and suggest that the female Sarcoptes scabier also is fertilized in her burrow The three colleagues have described observations which they claim prove that Notoedres infestations in rats are transmitted by the larvæ, and to a lesser extent by the nymphs, the adult females playing little or no part in the propagation of the disease They aver that it seems reasonable to believe that transmission of Sarcoptes scaling in human scalies is by the larvæ, and, to a lesser extent, by the nymphal stages The arguments postulated by these workers are attractive and receive the support of many climicians, but are vulnerable because they are based on analogies between Notoëdres and Sarcoptes scabrer var hommes, insects which, they admit, differ not only morphologically, but also biologically from each other

The views of K Mellanby<sup>2</sup> with regard to the method of transmission of scables are greatly at variance with those of Gordon, Unsworth, and Seaton He has stated that as a rule it is the fertilized adult female whose transference gives rise to this disease. In this stage the mite can lay viable eggs without any further intervention from the male He implies that if infection was spread by larvæ or nymphs, at least two immature mites of opposite sexes would have to invade the new host, and it would be necessary for them to mature and to meet at the correct time for fertilization. He states that on several occasions numbers of larvæ have been experimentally transferred to the skin of volunteers, and in no case was infestation produced, whereas definite proof has been obtained that adult female mites have transferred themselves from patients suffering from scabies to uninfested volunteers who have slept with them Other evidence is available to support Mellanby's contention, but he is careful to state that the evidence does not prove that infection by nymphs or larvæ is impossible, but does suggest that these are not the normally infective stages

Parasite Rate.—C G Johnson and K Mellanby³ publish the results of their investigation concerning the parasite population in 886 human cases of scabies. The average parasite rate (i.e., the number of adult female parasites found per case) was 113, a study of a further 2000 cases has given a strictly similar result. Mellanby² postulates the theory that if a patient has a very low parasite rate, say 5 or under, it is most unlikely that he will transmit scabies except to someone who sleeps with him night after night. Individuals with parasite rates between say 20 and 50 will readily transmit the disease to someone who sleeps with them, but they will rarely infect bedding, and will be of little danger during ordinary social contacts. The very small proportion of cases with very high parasite rates, on the other hand, are capable of passing on the disease in many ways.

It has been found that during a first infection the mites increase in numbers far less rapidly than is theoretically possible. A parasite rate of about 25 may be reached in 50 days and—very rarely—up to 500 in a hundred days, after this time the number of mites decreases rapidly. It is noteworthy that Sarcoptes is killed by pus and will not colonize septic areas. This means that scabies cases with severe secondary infection seldom have a high parasite rate. Mellanby avers that widespread secondary infection sometimes completely cures the primary disease.

W. C Bartley and K Mellanby have published jointly a paper which indicates that in a series of 119 female patients the average parasite rate was 125. It appears that in men and women a somewhat similar rate is found, but children are usually more heavily infected, in a small series of 18 children the parasite rate was 197. In children, and probably also in babies, the feet and ankles tend to be much more heavily infested than in adults. For reasons as yet unknown the hand of an infested woman usually has a higher parasite rate than the hand of a man, and whereas mites are practically never found on the palms of men, they are found on the palms to the extent of 75 per cent of the total mite population of infested women

Variation in Cutaneous Reactions in Scabies.—Mellanby has stated2 that the reaction of a host to the first infection of scabies is entirely different to his reaction to subsequent infection. During the first month of the first infection practically no symptoms are noticed occasionally transient irritation may be experienced, but there is no erythema at the sites of the burrows After a month, in the majority of cases, symptoms begin to be noted, and at about 6 weeks the irritation is sufficient to cause some disturbance of sleep and the pruntus characteristic of clinical scabies has developed the infection is allowed to continue for 14 weeks the itching is practically continuous and nearly unbearable. If now the patient is treated for the infestation, cured, and then reinfested, the course of the disease is completely Within 24 hours of the mites entering the skin intense local irritation develops and an obvious erythema is seen on the infested part, wheal-formation may occur. The infestation may be aborted at this stage in two ways firstly, the parasite may be removed by scratching, secondly, the reaction produced in the skin appears to make the environment unfavourable, and the female parasite may voluntarily leave the area and perhaps depart from the patient For these reasons Mellanby believes that second infestations with scabies do not readily occur, if, however, the parasites do succeed in becoming established for a second time on the host, the population never rises to the extent recorded during the first infection, for the dissemination of the infestation over the body of the host is continually retarded by his prompt reaction to the invasion on any new area. If by further experiments made by independent workers Mellanby's beliefs are proved to be correct, it is obvious that the customary views concerning the symptomatology and dissemination of scables, will require modification

Immunity.—Mellanby² claims to have shown that Sarcoptes causes antibody formation in man, and that this reaction causes a partial immunity to the disease. He prepared an extract by grinding up 150 Sarcoptes with silver sand in 10 c c of physiological saline, and after further preparation injected 0 1 and 0 2 c c of the fluid intradermally into volunteers. When six men who had never had scables were injected they gave no skin reaction. A similar result was obtained with men infested for less than three months. When, however, individuals who had been infested more than six months previously were injected, in six cases out of seven a very marked reaction, with wheal-formation, occurred within 36 hours, at the site of the injection, and was associated with itching this symptom was not confined to the site of the injection, for some individuals noted irritation at sites where the scables had been particularly troublesome

Prophylaxis.—In a further paper Mellanby<sup>5</sup> refers to scabies prophylaxis in schools and states his opinion that this is not practicable apart from the normal treatment of the disease, frequent examinations by personnel experienced in the diagnosis of the disease will reveal numerous cases, and if these and all their contacts are treated, the incidence of the disease can rapidly be

reduced He emphasizes the importance of treating all the members of a household in which a case of scabies occurs. Every practitioner knows numerous cases in which treatment has been given to the sole apparent sufferer from the disease, and signs of scabies have not again been noted in the family, but many practitioners also know of cases in which scabies remains a problem in one household until every member thereof has been treated. When dealing with the disease the problem of the 'silent carrier' must always be remembered. From Mellanby's work it would appear probable that this carrier is usually a person commencing his or her first attack of scabies and within six weeks of infestation.

Treatment.-In a paper in which is summarized the experience of one of our greatest authorities, H MacCormace states that for all practical purposes two sarcopticides have a sufficiently high efficiency index for routine therapeutic use-namely, sulphur ountment in one of its various forms, and benzyl benzoate. He emphasizes that both of these have stood the test of time, and that benzyl benzoate has been in use for some fifty years and was recommended for the treatment of scabies by both Radcliffe-Crocker and Malcolm Morris. Because ointment bases are in short supply and are hard upon clothing, an emulsion containing 25 per cent of benzyl benzoate, emulsified in water with 2 per cent lanette wax SX, is standardized as a war-time measure MacCormac believes that when one member of a household is known to have scables, it should be a rule that all members of that household should be treated, the mass attack being delivered at the same time for all, so as to avoid overlapping and reinfestation Patients are often inclined to over-treat themselves, renewed itching after properly supervised treatment is a warning against the use of active remedies, soap and water, and an indication for rest and the application of simple emollient ointments or creams He emphasizes that scabies complicated by eczema is a major dermatological problem, and that when impetigo is present—unless it is severe and extensive—it is usually best to treat the scabies first and then deal with the secondary infection, for which purpose 1 per cent gentian violet paint or ammoniated mercury (2 per cent) in zinc paste may be used.

In the MEDICAL ANNUAL of 1943,7 reference was made to the work of R.M. Gordon, D. R. Seaton, and G. H Percival concerning tetra-ethyl-thiuram monosulphide (tetmosol) R M Gordon, T. H. Davey, K Unsworth, F. F. Hellier, S. C. Parry, and J R B Alexanders have now shown that this drug when combined with soap in 5, 10, and 20 per cent dilutions retains its sarcopticidal properties. Tablets of the soap were used in the treatment of 6 men suffering from scabies. each man received five or six baths with 20 per cent soap on successive days, all were cured In a series of 110 men who received three baths with the soap over a period of a week, 80 per cent were found after six weeks to have been cured, and 20 per cent to have relapsed authors state, soap impregnated with tetmosol is unlikely to supersede any of the standard methods employed, which result in more than 90 per cent cures, but they consider that they are justified in believing that the generalized use of tetmosol soap in an infested community would reduce the incidence of scables by sterilizing some existing cases, and by destroying the infection in freshly invaded persons Such generalized use, however, will only be possible if it is found that a high incidence of dermatitis does not follow prolonged use

G H. Percival<sup>9</sup> and T. M. Clayton<sup>10</sup> have both reported favourably on the suse of tetra-ethyl-thiuram-monosulphide in the treatment of scabies. D. B Bradshaw<sup>11</sup> advocates an aqueous lotion containing 6 25 per cent of the compound as the treatment of choice for scabies in children. He states that it is

ainless, even on open sores and raw areas, and emphasizes the importance f this fact for the comfort of the patients, and for the reduction of concealment nd defaulting. He claims that the treatment is quick, reliable, and that here is little risk of dermatitis. The patient is given a bath and thoroughly crubbed with a loofah or soft nail brush, all crusts and scabs being removed. Ifter he has been dried he is painted from neck to soles with the lotion, and fter drying for ten minutes, he is allowed to dress. The routine is carried ut on three successive days, and patients have a clean set of underclothing in the first and last days, and clean bed linen, at least on the first day. In others are advised to wash the discarded clothing and bed linen in dilute ysol or similar antiseptic, but these articles are not disinfested by heat. The tra-ethyl-thiuram-monosulphide is gaining advocates, and doubtless other lew sarcopticides will be introduced.

There is one other acaricide which is useful, painless, fairly modern, and indeserving of oblivion. This is di-methyl-thianthrene, popularized by Bayer roducts under the name of Mitigal, and available as Sudermo (Burroughs Vellcome), or as Mesulphen (BPC). Dermatologists know its value, but it is of interest to note that R M Gordon and K Unsworth have shown it to be nore lethal to Notoedres than benzyl benzoate

The use of DDT, both as a preventive and curative agent, in scabies is till *sub judice* Preliminary reports indicate that this compound is much less uccessful in scabies than in other types of infestations

REFERENCES — 1.1nn Trop Med Parasit 1943, 37, 174, \*Parasitology, 1944, 35, 197, \*Ibid 942, 34, 285, \*Ibid 1944, 35, 207, \*Brit med J 1944, 1, 689, \*Practitioner, 1944, 152, 291, Med Aniu 1943, 309, \*Brit med J 1944, 1, 803 \*Ibid 1942, 2, 451, \*Ibid 1948, 1, 443, \*Lancet, 1944, 2, 278, \*Isin Trop Med Parasit 1948, 37, 195

#### CALENUS SYNDROME AND SHOULDER PAIN

Lambert Rogers, M Sc, F R C S.

R L Swank and F A Simeone believe that the mechanism producing ymptoms in the scalenus syndrome is compression of the brachial plexus is in a vice, the ventral jaw of which is the scalenus anticus, while the paricular structure forming the dorsal jaw varies. They report 15 cases and onclude that section of the scalenus anticus, by removing the ventral jaw of This may be so in most cases, but the reviewer he vice, renders it ineffective has had to operate on some in which relief had not been obtained by previous interior scalenotomy, but was obtained after the structure, a band or rib, peneath the lowest trunk of the plexus was divided Symptoms in such cases are probably due to a chafing action of the band or rib on the nerve-trunk which is stretched over it, and relieving the pressure in front will not, therefore, emove the chafing action. Evidence that this is so is presented by a recent ase. Symptoms were bilateral and on either side produced by a band peneath the lowest trunk of the brachial plexus On the right side both the scalenus anticus and the band were divided, on the left only the band symptoms were relieved on both sides -L.-C R]

With the dropping of the shoulder-girdle which occurs in adolescence any endency for the lowest trunk of the brachial plexus to chafe against or be stretched over a band or rib is exaggerated and thus symptoms commonly appear at this time. It is not surprising, therefore, that cases have been reported in young people in the Services. Long ago de Quervain<sup>2</sup> noted that life drill produced symptoms in young recruits in whom previously no servical rib had been detected. In the early days of the present war, when respirators were constantly carried, the drag of the respirator strap appeared to be a factor by further depressing the shoulder-girdle and evoking symptoms. Cases of this type have been reported by the reviewer. Symptoms are mostly

referred to the arm or forearm, chiefly on the ulnar side, and comprise pain, numbness, tingling, or even anæsthesia There may be weakness of the arm or hand and wasting and flattening of the thenar muscles. Occasional complaint is also made of vague pains around the shoulder-girdle. It must not be forgotten that there are other causes of pain around the shoulder and in the upper arm, and one which has more often been recognized recently is brachial radiculitis from a hermated intervertebral disc. The accompanying radiograph illustrates such a case and demonstrates the value of radiography in doubtful cases of shoulder pain The patient, a seaman aged 40, complaining of pain in the right shoulder for 3½ years, had been referred as a case of probable scalenus syndrome X rays showed narrowing of the intervertebral space between the fifth and sixth cervical vertebræ and the backward projection of the disc (Plate XLII) At operation a disc hermation over which the issuing nerve-root on the right side was stretched was demonstrated hermated nucleus pulposus was removed and the symptoms alleviated herniated discs in the cervical region cannot be regarded as a common cause of symptoms In the reviewer's series of 37 disc cases which he has operated upon, 3 were cervical, 1 was thoracic, and the remaining 32 were in the lumbar region (Other aspects of cervical rib and the scalenus syndrome are discussed in the MEDICAL ANNUAL, 1941, p 67, 1940, p 93)

REFERENCES — Arch Neurol Psychiat 1944, 51, 432, \*Quoted by Cushing, Bull Johns Hop Hosp 1903, 14, 315, \*R N Med Bull 1944, 8, 18, \*Rev Cir de Buenos Aires, 1941, 20, 541

#### SCARLET FEVER

Thomas Anderson, M.D., F.R.C.P.Ed

Epidemiology.—There has been a steady increase in the prevalence of scarlet fever during the last three years. In 1943, 116,033 cases were notified in England and Wales, the figures for 1941 and 1942 being 59,000 and 85,000 respectively. The type of disease remains mild, for only 134 deaths were recorded <sup>1</sup>

The Ability of Different Types of Hæmolytic Streptococci to Produce Scarlet Fever.—Under the auspices of the International Health Division of the Rockefeller Foundation a team of workers conducted a large-scale investigation of scarlet fever in Rumania (interrupted unfortunately by the war), and F F Schwentker² and his collaborators have now published a preliminary report It is impossible in a short abstract to do justice to the importance of their findings and only a few of the points can be recorded here. They found that in any single country, one or several strains predominated, but that there was no general uniformity between different countries. Their results may be summarized thus—

COUNTRY	PREDOMINATING TYPE
Hungary, Italy, Portugal, Turkey, China, and Scotland Denmark and Germany Bulgaria, Greece, and Rumania France and Yugoslavia Finland Latvia and Australia England	Type 1 " 3 " 10 " 27 " 6 " 17 " 1-4

From these findings it is reasonable to conclude that no particular type of streptococcus is associated specifically with scarlet fever (and, indeed, V D. Allison³ has recently pointed out that even in England all types have been encountered) Further, the types commonly present in patients with scarlet fever were in the same geographical region associated with other streptococcal

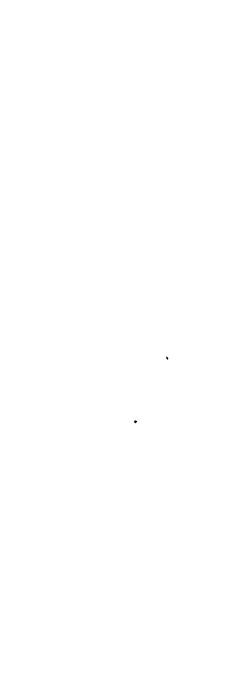
## PLATE XLII

# SHOULDER PAIN DUE TO HERNIATED INTERVERTEBRAL DISC

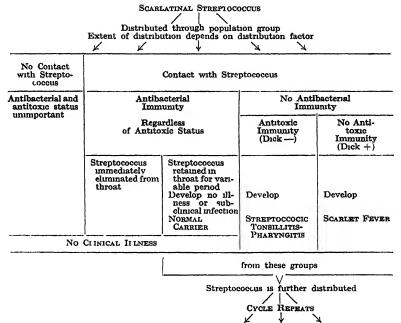
(LAMBERT ROGERS)



Radiograph showing narrowing of intervertebral space between C 5 and C 6 and backward projection of disc



infections. On the other hand, a type which was giving rise to scarlet fever in one district might be prevalent in another where scarlet was not occurring. Some phenomenon quite distinct from the mere ability of the strain to produce erythrogenic toxin was necessary for the appearance of cases of the disease. From their experience the authors prepared the following general plan to depict the main features concerned in the epidemiology of scarlet fever.—



R F. Watson and his co-workers4 record the use of sulphadiazine in cutting short an epidemic of scarlet fever which occurred in a large naval and a radiotraining station There were 95 cases, of which 72 were typed; from 71 of these Type 19 was isolated, the other being Type 1. Sulphadiazine was used in a dose of 1 g. daily (some received the drug in two doses, the others as one morning dose). During the first week after beginning preventive treatment in one of the establishments the new cases of scarlet fever dropped sharply from 10 a week to 5, and during the next three weeks only a further 5 cases occurred In the other establishment cases continued to arise until sulphadiazine was administered, when, here again, the incidence fell away at once. There was a marked reduction in the number of 'sick calls' for respiratory illness during the period of administration of the drug, in one establishment the average daily calls fell from 60 to 29, and in the other from 62 to 28 Despite the fact that the carrier-rate continued fairly high in both stations for Types 19 and 6, when sulphadiazine was stopped no further cases of scarlet fever occurred The time of stopping the drug, however, coincided with the Christmas vacation, so that many of the men went on leave for short periods, which may have had the effect of disturbing the 'epidemic constitution'. It is interesting to note that although the two commonest types carried were 19 and 6, and although both were found to be efficient in producing erythrogenic toxin, yet Scarlet Fever • 286 MEDICAL ANNUAL

Type 19 gave rise to cases while Type 6 did not [These papers are of great importance to our knowledge of scarlet fever even if they do not answer all the problems; clearly the mere presence of type strains of known virulence and capacity to produce a rash-toxin is not the sole factor in initiating epidemic spread A F. Coburn<sup>5</sup> has postulated that the strains must have an "epidemic capacity", but it is far from clear what this really means It is also curious that Type 19 recurs in each of the papers—from different parts of America—T. A 1

Memorandum from the Essex Epidemiological Committee.—This publications draws attention to the lack of justification for the practice of removing cases of scarlet fever to hospital while ignoring those other streptococcal illnesses, due to the same cause, which are of no less importance epidemiologically. Many of the complications of scarlet fever, it is pointed out, are due to cross-infection after admission to hospital Admission to a fever hospital should only be sought if the disease is severe, if another member of the household is employed in the preparation or distribution of food, if there is an approaching confinement in the house, or if the home conditions are inadequate. Unfortunately in the large cities the last condition only too often precludes any possibility of home treatment.

REFERENCES — Rep Min Hith 1944, 2 Amer J Hyg 1943, 38, 27, Brit med J 1944, 2, 351, J Amer med Ass 1943, 122, 730, US nav med Bull 1943, 41, 1012, Mem Essem Epid. Comm 1944, County Hall, Chelmsford

SCIATICA. (See Chronic 'Rheumatic' Disorders, Radiology)

# SCRUB TYPHUS (Mite-borne Typhus, Tsutsugamushı Disease) Major-Gen L T. Poole, DSO, MC., MB, DPH, K.HP Lt-Col. H J Bensted, OBE, M.C., RA.MC.

On account of its prevalence among troops engaged in jungle warfare, scrub typhus has sprung into prominence in the war against Japan. This is no new disease, but the present opportunities for its intensive study have not existed before. Scrub typhus occurs throughout the South-West Pacific and the China-Burma-India theatres of operations, and is much more widespread in its geographical distribution than was originally appreciated. From experience gained in the field, all now realize the danger of assuming that any jungle in these theatres of war is free from this infection. Therefore, all medical officers with the Eastern Armies need to keep in mind the possibility of scrub typhus when considering the differential diagnosis of pyrexias of uncertain origin. Since this infection has assumed considerable military importance, the object of this article is to give the salient features of the disease in as much detail as our space permits.

Actiology.—Scrub typhus is a specific infection caused by a member of the rickettsial group of organisms that is antigenically distinct from the rickettsiæ of both epidemic (louse-borne) and endemic (flea-borne) typhus. It has been accepted that the disease is transmitted to man by the larval form of certain species of mites; and various rodents can act as a host reservoir. In man, the disease takes the form of a fever of sudden onset that varies in severity and lasts from 2 to 3 weeks. A mottled rash may appear about the fifth day, in a proportion of cases, a small necrotic ulcerative lesion of the skin, known as the eschar, is present where the vector has fed

Geographical Distribution.—The disease occurs in sharply-defined areas, and within these in circumscribed districts. It is endemic in Japan, Formosa, the Pescadores Islands, Borneo, New Guinea, Queensland, Java, Sumatra, Malaya, French Indo-China, Burma, India, and Ceylon. But as more laboratories are made available where the diagnosis can be confirmed it will probably

be found to occur also in certain parts of China, in Korea, in Siam, and in many of the Pacific Islands

In Japan the infection is limited to areas near the banks of certain rivers. but in Formosa it is widely distributed and occurs not only in the vicinity of river banks but also in the cultivated fields, in the jungles, in the plains, among the foothills, and even in the mountains. It is endemic in the Pescadores Islands, although here the affected areas are limited, because, it is suggested salt water is swept across parts of the islands by a strong monsoon and upsets Cases have been reported from parts of New the bionomics of the vector In Queensland, Australia, several fevers resembling scrub typhus They are known by a variety of names—scrub typhus, coastal fever, and Mossman fever, but, apart from confusion in diagnosis, they are all probably one and the same disease In Sumatra, the extremely prevalent mite fever, or Seulimeum fever, has been reported as causing widespread outbreaks among gangs of coolies working in the jungles Likewise in Malaya, the disease is prevalent and sporadic cases are frequently reported. In the Federated Malay States, scrub typhus has been named "rural" typhus to distinguish it from murine typhus, which is also endemic but occurs in urban districts. In certain parts of Burma, India, and Ceylon, it has been known for many years that scrub typhus may occur in persons exploring the jungles and wandering amongst the scrub It will thus be seen that in the East it occurs in many lands.

Transmission.—The virus is transmitted by the larval form of certain mites But the only species that is certainly known to convey the infection is the Trombicula akamushi, which belongs to the genus Trombicula, family Trombididing, order Acarina. As in all acari, the adult and nymph have four pairs of legs, but the larva has only three The adult does not bite man but lives on the juices of plants. It is found under fallen leaves, under decaying vegetable matter, and buried in the ground in fine sandy soil deposited by This type of soil and vegetation is an important factor in the river floods mite's existence, hence the sharply-defined areas in which it is found. The eggs are laid in the ground In course of time a reddish, hairy, larva, about 015 to 04 mm in size hatches out, and, unlike the adult in its manner of feeding, it requires a blood meal In its travels in search of a host the larva climbs twigs and grass rarely many inches above the ground, and, attaching itself to the skin, feeds for about four days and then drops off replete with blood. Mites infest rodents of all kinds, possibly also birds and reptiles. On rodents they are most often found attached to the ears and scrotal area, where they appear to cause little or no irritation, although on man they may cause intolerable itching But when they crawl on the skin they are not felt except on the face, ears, and hair, even after they attach themselves by their mouth-parts, no itching sensation is experienced for 10 to 18 hours. After this time a small red raised area of skin appears about 1 in in diameter and in the centre of this the mite is found It holds on tenaciously and is not easily got rid of except by scratching; this removes not only the mite but also a small piece of skin. If the skin is not scratched, itching ceases in about 4 or 5 days But removal of the mite in the early stages of its attachment will not prevent the development of an itch spot. Mites usually reach the body from the feet, but this does not mean that the ankles and legs are most bitten. Indeed, men standing among mites may be extensively bitten about the waist and armpits. When fed, the larval mite buries itself in the earth, and in time it moults The nymph emerges, and after passing through several nymphal stages, it reaches the adult form. Little is known of the habits of the nymph, for, like the adult, it does not bite man. It is believed to be a vegetable feeder. If this is so, then the infection must be hereditary, as the mite takes only one blood meal in the whole of its long life cycle.

The Trombidduæ are widespread in their geographical distribution. In the U.K. they are known as "harvest mites", in America as "chiggers", and in Australia as "mokkas". There are a great many species, but, as already emphasized, only Takamishi has been definitely incriminated as a vector of scrub typhus. Others have long attracted suspicion—Takensis and Twalchi, for example. More recently certain species of Schongastia—and some other species—have also come under suspicion. Until our knowledge is more complete, any species biting man in the tropics must be looked upon as a potential source of danger, and we have also to recognize that transmission may not be confined to the mite.

Epidemiology.—Scrub typhus is a disease of localities, and rodents constitute the primary reservoir of infection In certain districts it has a seasonal incidence, in others it occurs throughout the year. Thus, in Japan it is most frequently contracted in July and August, on the Indo-Burma border in November and December, and in certain parts of India in the months following the rains. On the other hand, in Malaya the disease is by no means seasonal. cases occurring every month throughout the year. This may be attributed to many factors, important amongst which are moisture, temperature, and possibly particular types of vegetation Mites, in general, are very much more active after a shower of rain than when rain is actually falling or when the ground is Activity is also greatest when the temperature under the foliage in neither too hot nor too cold, under very cold conditions, mites become motion-In certain types of vegetation these creatures appear to be more troublesome than in others; but it is not yet clear whether this should be attributed to the particular kind of growth or to the suitable conditions of the soil; both probably play their part Seasonal prevalence may also be explained by the simultaneous hatching of the majority of the larvæ when the environment becomes favourable to the development of this stage of the life cycle But our present knowledge of mite ecology is not great enough to allw us to distinguish those localities in which the infection is likely to be present from those in which it is not. But it may be said in general terms that the areas to be avoided are those along the course of rivers that flood and deposit fine sandy soil in the fields, those where thick luxuriant growth of scrub abounds, and those where tall, coarse, grass, such as lalang and kunai, is found bordering jungle land

Mite typhus is an endemic disease It does not give rise to epidemics, although outbreaks may sometimes assume serious proportions among bodies of men Flea-borne typhus, also an endemic disease, may occur in the same area as mite typhus; both are non-contagious and are difficult, if not almost impossible, to distinguish from each other on purely clinical grounds

Pathology.—Like the other rickettsial infections, scrub typhus is essentially a disease of the very fine blood-vessels. The vessels mostly affected are those of the skin, central nervous system, heart, and lungs. No characteristic naked-cyc changes are seen post mortem because the lesions consist of microscopic nodules. The first step in their formation is a swelling of the endothelial cells lining the fine capillaries—within these swollen cells rickettsial bodies may sometimes be observed, the irritant effect on the lining of the vessel may lead to thrombosis and hamorrhage, while around the vessel there is an accumulation of cells consisting mainly of monocytes, lymphocytes, and plasma cells. The distribution of these nodules is reflected in the signs and symptoms that occur during the course of the fever. Though similar in essential structure to those seen in epidemic typhus, the nodules in scrub typhus differ in one important respect—they are much less conspicuous and therefore easily missed.

Chest symptoms are of usual occurrence early in the illness; and on the analogy of pathological findings in experimental animals, it has been suggested that these symptoms may be caused by a true rickettsial pneumonia. At a later stage in the disease, bronchopneumonia may appear as a serious, often terminal, complication. Specific changes in the brain do not differ materially from those found in exanthematic typhus, except that the focal reactions are few in number, and being scattered widely, are not readily detected. In the heart, severe reactionary changes of the myocardial vessels are accompanied by round-celled infiltration of the interstitial tissue and cedema of the muscle-fibres. The lesions in the skin are those of a perivasculitis affecting the minute blood-vessels

Churcal Picture.—As in practically all acute infective fevers the severity of the attack varies from the mild ambulatory type of case to the profoundly toxic variety that terminates fatally. In a moderately severe case, after an incubation period of from 10 to 21 days, the patient suddenly feels ill. There is intense retro-orbital headache, accompanied by the usual febrile reactions that usher in an acute fever, with the addition, in many cases, of sore throat and slight cough. At this stage of the disease the fever might obviously be attributed to many actiological agents, but the following points may be helpful in guiding the clinician .—

In a locality in which scrub typhus may be expected to occur the character of the headache may point to the possibility of this infection. Experienced observers have remarked on the headache as an outstanding feature of the disease; its intensity, persistence, and excruciating character, make it an agony even to turn the head on the pillow. An additional sign that may point to the diagnosis is the presence of an eschar. If one is seen, this is of great diagnostic significance, but it is detected in only a proportion of the cases. As it may not have been noticed by the patient, and as no complaint is made of it, a very careful and thorough search may be necessary for its discovery. Associated with this lesion is enlargement of the related lymphatic glands in particular, but in general the lymph-glands all over the body may be palpable and may remain so throughout the disease

In the first week of the illness as the fever progresses the temperature rises steadily to reach 104° F, the eyes become suffused, the cough increases, and mild deafness develops. About the fifth day, a mottled rash may appear, which may ultimately become maculo-papular in appearance; but the rash is neither regular in form nor of fixed distribution, and in the dark-skinned races it may be difficult to detect. Headache continues, apathy and prostration set in, and slight neck rigidity is observed.

During the second week, which is the critical period of the disease, the patient is lethargic yet complaining, and he may suffer from transient delirium. The toxic state manifests itself in the signs referable to the central nervous system Nerve deafness increases, the superficial and deep tendon reflexes are elicited with difficulty The cerebrospinal fluid is under increased pressure, but it shows no abnormalities of a specific character The cardiovascular system also suffers, the main sign being hypotension. The falling systolic and diastolic bloodpressure and the softened heart-sounds indicate the action of the toxic and infective processes on the myocardium The pulse-rate varies, but the rhythm All severe cases exhibit abnormal physical signs in the chest. There ıs regular may be some duliness on percussion, but there is no mass consolidation sputum is frothy and may be tinged with blood, but it is non-purulent. On culture no particular organism predominates, the bacterial flora being mixed If circulatory and respiratory embarrassment occur, cedema of the dependent parts becomes pronounced and the patient cyanosed

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During the third week recovery sets in The temperature falls by lysis, and the chest-signs clear There is improvement in the patient's colour and the blood-pressure rises. In all severe cases, and in many milder infections, a diuresis sets in and with its progress the ædema disappears. This discloses, perhaps for the first time, how much flesh has actually been lost Until the diuresis, loss of flesh and cedema may each mask the presence of the other, giving the patient a deceptive appearance of normality. Thus, with the diuresis, there may come a sudden worsening of appearance that, combined with intense physical weakness, may present an alarming picture, especially as the diuresis usually precedes by 8-4 days any permanent return of the temperature to normal. But though he may look worse, the patient usually feels much better In fact, the onset of diuresis is evidence that retention of fluid has ceased, its occurrence is a good prognostic sign. One of the writers (H J. B), who suffered from a severe attack of this fever, noted in his misery the onset of diuresis. At the same time his mental confusion cleared, and it felt to him as if he had suddenly emerged into an atmosphere of immutable peace and quiet. The transformation seemed unreal

The eschar or initial dermal lesion merits somewhat detailed description. This is the sore that is produced by the infecting mite, it is not present in every case, but when seen, it is a most valuable diagnostic sign. As already emphasized, careful search may be necessary to find it. For several reasons it may not be found—the more important being that it may develop to no more than a papule which disappears during the incubation period, and that it is less often a feature of the disease in certain scrib typhus areas than in others

The typical lesion is a black crust, round or oval in shape, surrounded by a sharply defined area of redness The crust is slightly depressed below the surface, and, if round, measures about 5 mm in diameter. In the early stages of its development only part of the central crust may be black, the rest being grey, and the red areola may shade off into the adjacent skin. When the black crust comes away, a well-defined pit is left that has the appearance of a punchedout ulcer. In sweaty areas of the body, such as the groin, the ulcer is moist and may be infected with secondary pyogenic organisms. In other regions it is dry Although the ulcer does not increase in size during the course of the disease, it does not heal and the area of hyperæmia around it becomes more pronounced, this is a point of importance in distinguishing an eschar from other sores, for these usually heal within a few days after the patient comes under medical care. The eschar takes about 3 or 4-weeks to heal, and it leaves a pitted scar The ulcer may be found on almost any part of the body, the site being determined to some extent by the clothing worn and by whether the victim has been bitten when walking through long grass or resting on the ground: When the mite reaches the clothing, it crawls to the nearest accessible skin and, attaching itself, begins to feed.

Laboratory Diagnosis.—The causative agent, a rickettsia, is present in the patient's blood in the early stages of the disease and can be transmitted to the white mouse. This animal is highly susceptible to the infection, and the diagnosis can be confirmed by demonstrating rickettsiæ in stained smear preparations from its tissues. The procedure is relatively simple, nevertheless, great care must be taken when handling infected material to prevent infection among the laboratory staff. A small portion of blood-clot is ground up in saline and centrifuged at low speed to remove gross matter, a small amount of the supernatant fluid is then inoculated intraperitoneally into white mice. The animals due in from 10 to 16 days with a distended abdomen, which, on being opened, presents an opaque fibrinous exudate, a dull and lustreless peritoneum, and a greatly enlarged spleen. Microscopically, the rickettsiæ can

be demonstrated after staining by Giemsa's method, typically, they are seen in large clusters in the cytoplasm of the affected endothelial cells. Morphologically, they are in the form of small cocci and also as bipolar bodies or rods exhibiting bipolar staining, with Giemsa's stain the ends of the bipolar forms are reddish, and the intermediate filaments are bluish

Other rodents can also be infected. In rats a symptomless disease is produced, and thus the white rat can be used for sending rickettsial strains from one laboratory to another for their identification and study. Guinea-pigs are not highly susceptible, and infection with scrub typhus rickettsiæ does not give rise in these animals to a scrotal reaction such as is produced by murine-endemic strains. Rabbits can be infected, although with some difficulty, by injecting material containing rickettsiæ into the anterior chamber of the eye. After an incubation period of about 4 to 7 days, an acute irido-cyclitis develops and rickettsiæ can be demonstrated microscopically in the endothelial cells of Descemet's membrane. Intradermal inoculation of the monkey is followed by a fever, and in a proportion of cases by a reaction at the site of injection characterized by a papule that becomes necrotic and ulcerates with swelling of the related lymphatic glands

Serological Tests.—The Weil-Felix agglutination reaction using the OXK type of Proteus strain is of unquestionable value in the diagnosis But, as a rule, the rise in the agglutinin titre does not manifest itself until after the The best use of the seventh day, and it may be first apparent in low dilution test is made by following the rise in titre during the course of the illness and its gradual fall during convalescence, to observe this the agglutinin curve should always be charted A good working rule with suspected cases of scrub typhus is to test the serum on at least 8 different occasions—on or before the seventh day to obtain the pre-infection agglutinin level, on the fourteenth day when, in the majority of cases, a significant rise is present, and on the twenty-first day to catch those cases in which the reaction may be feeble or late in developing The agglutinin titre begins to fall in the fourth week, the decrease during convalescence being somewhat irregular It is difficult to state categorically the lowest serum dilution that should be accepted as indicating a positive Most workers are of opinion that a dilution of over 1 in 100 is signifireaction cant On the other hand, cases of undoubted scrub typhus have been reported where the titre has been only 1 in 50, or 1 in 25, occasionally no OXK agglutinin response whatsoever has been found in cases where the diagnosis has been proved by isolating the rickettsiæ. At the other extreme, the titre may be as high as or even higher than 1 in 50,000. Study of a large number of cases suggests that the titre of this particular antibody does not bear any relationship to the severity of the symptoms

A detail of importance in carrying out the test is to ensure that a reliable bacterial suspension is used. It has long been known that suspensions of *Proteus OXK* are unstable and cannot be preserved for any length of time For this reason the *Proteus* suspension should be prepared locally by the bacteriologist from a non-motile smooth strain and kept only for a limited period unless centrally prepared suspensions can be obtained frequently. Since endemicmurine typhus may occur in an area in which scrub typhus is found, agglutination tests with *OX*19 and *OX*2 suspensions should also be carried out. A slide agglutination test may also be used But as a positive result can be detected only with high titre sera, negative findings should always be confirmed by the tube and water bath method.

A rickettsial agglutination test can be carried out with a suspension of rickettsiae made from infected mouse lung, and a rickettsial complement-fixation test can also be performed. The results of the Weil-Felix reaction, and of

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rickettsial agglutination and complement-fixation tests, indicate an absence of common antigenic factors between epidemic, endemic-murine, and scrub typhus. Rickettsial agglutination and complement-fixation tests can be carried out only at specially selected laboratories, they have an advantage over the Weil-Felix reaction by reason of their specificity, and they are also useful to exclude an anamnestic reaction that sometimes occurs both with OX19 and OXK agglutinias. It has yet to be determined whether the sera of recently inoculated individuals show an anamnestic reaction with rickettsial agglutinias.

Blood Changes.—In the early stages of an uncomplicated infection, no changes of diagnostic significance appear in the red or white blood-cells. Therefore, at this stage a leucocytosis or a leucopenia will indicate some complication that may call for a specific line of therapy. But the lymphocytes appear to play an important part in this disease, and after the early stage of scrub typhus the differential leucocyte count may be of considerable prognostic value. In nearly all non-fatal cases in New Guinea, Australian Army workers have noted an increase in the lymphocytes just before the patient starts to show clinical improvement, and the more severe and prolonged the illness, the later the appearance of the lymphocytosis

Urme Examination.—Urine examinations indicate that, in the uncomplicated disease, the infecting agent has no specific action on the kidneys. Albumin, casts, and red blood-cells are encountered no more often than in any severe fever. Valuable information can be obtained by measuring the urinary output. The Australian workers have emphasized that in all severe, and in many moderately severe, cases there is a retention of fluid until defervescence is about to occur. Diuresis then sets in. The factors responsible for fluid retention are still under investigation, but it is clear that intravenous administration of fluids during the course of the fever may not be without danger.

Differential Diagnosss.—As with all fevers of uncertain origin in the tropics the first disease to exclude is malaria. If blood-smears are negative and the temperature does not respond to antimalarial treatment three days after admission to hospital, blood culture to exclude the typhoid group should be carried out together with serological tests to determine the basic agglutinin titre not only for the enteric group of diseases but also for the typhus group. Clinically, an eschar with enlargement of its related lymphatic glands may point to the diagnosis, and this should be carefully looked for The presence of a rash and a rise in the OXK agglutinis will later confirm the diagnosis Dengue fever may closely simulate scrub typhus in the early stages, but this fever rarely lasts longer than five days Infective hepatits requires exclusion, and the possibility of leptospirosis should also be borne in mind

Case Mortality and Prognosis.—The mortality-rate is extremely variable, and has ranged from nil in certain groups of cases up to 33 per cent. The general condition of the victim no doubt must play a part. Yet it has been noted that in certain instances the case fatality-rate has been higher in men in first-class condition than in those whose physical state has been lowered by the hardships of war. Prognosis in such circumstances becomes difficult. Therefore, each case must be judged on its own ments and all relevant signs and symptoms fully assessed, more particularly the state of the cardio-vascular system, the degree of neurological involvement, and the leucocytic changes in the blood

Treatment.—There is no specific treatment Convalescent serum has been tried with unconvincing results, hyperimmune serum, prepared in the rabbit, is under trial. The sulphonamide derivatives and penicillin are without effect and should only be administered to treat those complications for which they are

The most important measures are expert nursing and symptomatic treatment Scrub typhus is usually contracted at a distance from hospital, and, as patients do not stand an overland journey well, they are best evacuated by air. On arrival in hospital they should be confined to bed and given absolute rest—physical and mental Restlessness should be controlled by sedatives, which should be liberally administered both by day and by night barbital has been found useful, but to ensure sleep morphine may be required as For extreme restlessness, morphine and hyoscine or even paraldehyde may be required Experience has shown that sufficient emphasis cannot be laid on the necessity of complete rest Headache is a constant complaint, and there may be muscular pains These may be relieved by phenacetin or aspirin, with perhaps the addition of \( \frac{1}{6} \) to \( \frac{1}{2} \) gr. of codeine If the headache is intractable, and associated with neurological signs, lumbar puncture may bring Malaria may complicate the rickettsial infection, and the greatest care should be taken to exclude this disease by frequent examination of blood-If present, it should be treated with mepacrine or quinine in the standard dosages Bacillary dysentery may also be a complication, it can be controlled If acute symptoms of amœbic dysentery are present by sulphaguanidine emetine will be required and the administration of succinvl sulphathiazole, or penicillin, may also be tried Although these drugs have no specific effect on the entamceba they are useful in clearing up the secondary invaders To relieve the cough, which may be troublesome, sedative mixtures should be given, when cyanosis is present relief may be obtained from oxygen administration From a consideration of the pathological changes in the heart, it will be obvious that little can be expected from cardiac stimulants The diet is important and should follow the usual lines adopted in the nursing of any severe fever The period of convalescence will vary with the severity of the attack, after a mild infection convalescence should not be unduly prolonged, but when the illness has been severe the amount of exercise must be graduated, and the general condition of the patient should be taken into consideration in building up the tissue strength

Prevention.—Animals experimentally infected with scrub typhus are immune to further attacks. This fact holds out the possibility of preparing a killed vaccine for active immunization against the disease. But many technical difficulties are associated with the manufacture of all rickettsial vaccines since rickettsiae will grow only in the presence of living cells. The technical problems are increased when dealing with strains of scrub typhus, for these differ from epidemic and endemic strains in the greater difficulty of adapting them to multiply in the developing chick. An egg vaccine prepared along the lines suggested by Cox, and so successful against epidemic typhus, has not proved as yet to be of value. Other methods of preparation are being tried with encouraging results, and it is likely that a vaccine will be forthcoming at an early date.

As in other forms of typhus, measures have to be taken against the vector During the past few years advances of far-reaching importance have been made with insecticides and insect repellents. Among the synthetic compounds so far prepared and actually taken into use in the field against the mite, two in particular have been found to be of great value—namely, dimethyl phthallate and dibutyl phthallate. Each has its different merits; thus dimethyl phthallate is effective against the mosquito as well as the mite, whereas dibutyl phthallate has no action on the mosquito. Against this, clothing impregnated with dimethyl phthallate cannot be laundered as many times as that treated with dibutyl phthallate before losing its repellent properties. Therefore, local circumstances have to be fully considered before a choice is made. The method

of impregnating the clothing is of importance, since distribution of the chemical must not be patchy. Dipping is the ideal practice, but smearing the repellent on the clothing by hand is more economical and quite effective if it is done thoroughly. The well-known DDT is of little value against the mite as compared with the compounds just mentioned

Camp sites should be well chosen and cleared of grass so that the ground may become as dry as possible, for this will reduce the number of mites. Mites are to be expected so long as the ground is soft and damp and while animals abound that may act as suitable hosts. It is very important that all persons should be adequately protected against mites, and above all, that sleeping on the ground should be avoided. But it may be noted that mites will disappear from paths, tent floors, and other surfaces when these have become well trodden

Scrub Typhus and Military Operations.—The great importance of this disease has not been overlooked in planning military operations in the Far East Special teams of investigators are at work in all the Allied Armies engaged in this theatre, and intensive research is in progress at several centres throughout the world. All aspects of scrub typhus are being fully studied by climicians, hygienists, chemists, pathologists, and entomologists, and the results of their work are being applied without delay. There is good reason to hope that victory against the Japanese will be accompanied by at least substantial advances against this other enemy of civilization in the Far East.

SEASICKNESS. (See Pharmacology and Therapeutics)

SEX HORMONES. (See also STILBESTROL AND CANCER)

Sir Walter Langdon-Brown, M D, D Sc., F R C P Samuel Leonard Simpson, M A, M D., F R C.P

Post-menopausal Bleeding and Diethylstilbæstrol Therapy —E Novak¹ states that although stilbæstrol is of great value in controlling menopausal symptoms, the use of large doses may lead to uterine hæmorrhage, which, in view of the age of the patient, may call for diagnostic curettage to exclude a possible pre-existing cancer To obviate such bleeding, Novak recommends the minimal effective dose, and finds that this varies between 0 1 and 0 5 mg per day. In many patients it is unnecessary to continue the dosage for long periods. [Some patients do require larger doses, and withdrawal bleeding can often be avoided by gradually decreasing the dose before ceasing the therapy]

Hexestrol.—In 1937 Dodds and Lawson synthesized diethylstilbæstrol (stilbæstrol) Bishop found it could replace æstradiol in the treatment of the menopause In 1938 Campbell, Dodds, and Lawson synthesized a hydrogenated form of diethylstilbæstrol and called it hexestrol. Together with Noble, they showed that in rats hexestrol was slightly more active than stilbæstrol, and three times as active as æstradiol J G Crotty, S A Schloss, and G. Lyford² confirm the findings of several clinicians that hexestrol, when given by mouth, is qualitatively as effective as stilbæstrol in menopausal disorders, senile vaginitis, vulvovaginitis in children, certain forms of dysmenor-hæa and amenorrhæa, etc., but has the advantage of causing nausea or vomiting in a much smaller percentage of patients. They found that hexestrol must be administered in 3 to 5 times the dosage of stilbæstrol, but their daily dosage varied from 0 2 mg to 5 mg hexestrol

[Our clinical experience is more in keeping with animal experiments, namely, that hexcestrol is as quantitatively potent as stilbcestrol. More recently diencestrol has been synthesized, and is available in tablets of 0.1 mg and 0.8 mg, and clinically appears to be more effective quantitatively than both stilbcestrol and hexcestrol, but has similar qualitative effects ]

Changes in Optic Function and Ophthalmoscope Picture in Eunuchoids treated with Orchitic Extract.—Four eunuchoid patients with visual changes, in one due to a pituitary or parapituitary tumour, were treated by M Kutscher<sup>3</sup> with testicular extracts, and apart from sexual and general benefit, there was a return towards normal vision and more normal objective fundal findings in all cases. Thus defective visual acuity, diminished amplitude of accommodation, contracted visual fields, hyperæmia and papilicedema, were all ameliorated It is known that testosterone produces changes in the pituitary gland of an inhibitory character, and this may be a partial explanation. The authors, however, indicate similar benefits from testicular extracts in non-endocrine conditions, e.g., syphilitic atrophy of the optic nerve, and retinitis pigmentosa, and suggest that there is probably a place for testosterone therapy in ophthalmology

REFERENCES — J Amer med Ass 1944, 125, 98, 2Surg Gynec Obstet 1943, 77, 130, 2Arch intern Med 1943, 72, 461

SHOCK, TRAUMATIC. (See BLOOD TRANSFUSION)

SIMMONDS'S DISEASE. (See PITUITARY GLAND)

#### SMALL-POX AND VACCINATION.

Thomas Anderson, M D, F R C P Ed. Chemotherapy. - S. G. Vengsarkar and J. V. Rangnekar<sup>1</sup> survey a total of 548 cases, to 312 of which sulphanilamide was given, while the remainder (236) served as controls and received symptomatic treatment An average of 26 0 g. of drug was given over 6 days 
Cases admitted in the stage of crusting and those who died within forty-eight hours of admission were not included Previous reports on the use of this sulphonamide have been by no means unanimous in their approval The present authors, however, conclude that the mortalityrates were reduced, that the evolution of the rash was altered, the vesicles becoming flatter, the pustules less turbid, and the scabs separating with less pitting, and that although toxemia was not affected, secondary fever was much reduced in incidence The series is a large one, but when subdivided into those vaccinated and unvaccinated and again into the three clinical forms, the individual groups become small. Over all, in the previously vaccinated persons the fatality-rate was reduced from 164 to 142 per cent, in the unvaccinated from 30 9 to 27 0 per cent-neither of the differences being large, nor indeed statistically significant [From the tables it may be noted that on the clinical classification there was originally a greater proportion of 'discrete' cases among those given sulphanilamide —T A] The most striking reduction was in the occurrence of secondary fever, which was noted in 50 per cent of the sulphamlamide group and in 80 per cent of the controls [The age-distributions of the vaccinated and unvaccinated groups showed an interesting contrast in the vaccinated group only 9 per cent were under 15 years, whereas in the unvaccinated no less than 54 per cent of the cases occurred in this group.-T. A]

Penicillm and Small-pox.—W D Jeans, J. S Jeffrey, and K Gunders' report an interesting series of cases. They point out that secondary infections of the pustules (usually staphylococcal) must be responsible for much of the late toxemia. They encountered 87 cases in a general hospital, of which two confluent cases died almost at once Of the remainder, 31 were mild, but in 4 the disease was severe and progressive On the 6th day the rash was confluent, and it was considered that the outlook was critical (All had received sulphathazole from the early stages of the disease in average doses of 32.0 g)

Cultures of the pustules showed a heavy growth of Staph aureus next 3 to 4 days an average dose of 400,000 units penicillin was given in doses of 15.000 intramuscularly every three hours Three of the cases showed pronounced improvement within twenty-four hours the pustules dried quickly with minimal pock-marking; cultures from the pustules were either sterile or showed but one or two colonies The fourth case developed confluent smallpox on top of a dermatitis and died on the 13th day after receiving 435,000 units of penicillin Before death the skin was stripping as in a case of exfolative dermatitis or pemphigus Apart from a reduction in the number of colonies isolated from the pustules from 21 to 2, this case showed no appreciable clinical improvement. One of the recoveries was obtained in a conscientious objector to vaccination who had never been vaccinated at any time developed confluent small-pox The first examination of pustular fluid on the 6th day yielded an abundant growth of Staph aureus twenty-four hours later only 3 colonies could be obtained By the 15th day the temperature and pulse had settled, and on the 17th day scabs were separating, leaving a dry parchment-like skin

Vaccinal Encephalitis .- As a result of an outbreak of small-pox in Fife. Scotland, a public vaccination campaign was inaugurated and 75.326 persons were immunized G M Fyfe and J B Fleming<sup>2</sup> record the 9 cases of encephalomyelitis that developed The ages ranged from 3 to 17 years, and the onset of symptoms occurred between 10 and 12 days after vaccination There were 6 cases of encephalitis, of which 4 died, 2 of myelitis and 1 of lymphocytic meningitis, which recovered Many of the cases showed evidence of an upper respiratory catarrh or of tonsillitis, and the authors consider that this may have predisposed to the attack Two of the cases were blood relations and The patients with encephalitis showed the usual signs of headache. vomiting, drowsiness or coma, and paralyses None of the recoveries showed residual mental or nervous disturbance The two examples of myelitis which were encountered were not of a severe grade and recovered rapidly onset of one case simulated tuberculous meningitis, but improvement was rapid and she was discharged well in ten days. Lister Institute anti-vaccinal horse serum was given to two patients, and parental serum (from parents recently vaccinated) was used in four The authors considered that the administration of serum was beneficial, and they suggest that in a vaccination campaign when children other than infants must be vaccinated for the first time, the parents should also be vaccinated to ensure a supply of human immune serum for treatment should occasion arise [In view of the failure of immune sera in other virus diseases, e.g., poliomyelitis, the argument in favour of the use of serum, human or other, cannot now be regarded as strong The wide clinical variation in the degree of illness of vaccinal encephalitis, and the amazing improvement which sometimes occurs spontaneously even in the most severe cases, make it impossible to give credit to any particular method of treatment because of an occasional apparent cure -T A]

REFERENCES — J Indian med Ass 1944, 13, 213, \*Lancet, 1944, 2, 44, \*Brit med I 1943, 2, 671

### SOCIAL ASPECTS OF PSYCHIATRY. Aubrey Lewis, M.D., F.R.C.P.

The health of university students is regarded in the United States as a major responsibility of the academic authorities, and in the Students' Health Service organized in each College adequate attention is paid to the psychiatric problems the students may present T Raphael and L. E Himler¹ have carried out an analysis of the psychotic disorders met among men and women students of the University of Michigan at Ann Arbor They found that schizophrenia

occurred in 11 per cent of the students seen during the period 1930 to 1942, and paranoid psychoses occurred in 0.2 per cent. The corresponding figure for manic-depressive psychosis was 0.9 per cent, and for epilepsy 1.1 per cent. It was only in the case of epilepsy that the incidence among men was higher than among women In one-third of the students referred to, their chief complaint and focus of attention had to do with some physical disorder, half the cases seen had been referred to the mental health clinic by general physicians of the Student Health Service Valuable data are also given as to the stage of the student's University career at which he first comes under notice for a psychiatric disorder, some of the students, especially among the post-graduates, were chronic schizophrenics who had been able to carry on with their courses for a considerable time When the past record sheets of these students were scrutinized it was found that at the time of entry into the University only half of the psychotic ones had entered under the appropriate heading on the relevant form anything indicative of previous instability or psychopathy. [There are a number of other observations in this report which are not without interest for our own universities and medical schools No comparable statistics exist here, and it is therefore impossible to know how far the Michigan findings would hold good in this country -A L]

B Apfelberg, C Sugar, and A Z Pfeffer<sup>2</sup> surveyed 250 non-psychotic men sent into Bellevue Hospital between October, 1941, and October, 1942, because of sexual offences thought to require psychiatric examination, offences against children and exhibitionism were the commonest. Only a quarter of the men were married and living with their wives at the time of the offence. One-third of them had been previously charged with sexual offences, and rather more than one-third previously charged with non-sexual offences, 53 were not considered to exhibit any psychiatric abnormality

In a brief report of 1000 offenders received in naval detention quarters for the first time, R R Prewer<sup>3</sup> states that 227 of these men were mentally abnormal, 59 were unstable and mentally retarded, their mental ages varying from 8 to 11. Nearly 9 per cent had a psychopathic personality and displayed emotional instability

In spite of the many methods of treating alcoholics that have been advocated, there remains in all countries a disturbingly large proportion for whom medical and social measures are ineffectual. Religious organizations have concerned themselves with these, as with other castaways. A vigorous recent attempt to bring religion to their aid has had remarkable success in the United States. It was begun in 1934 by William Wilson, who was led by personal religious experience to found "Alcoholics Anonymous". This is a society made up of people whose lives had been so runned by drinking that they felt they had no resources left with which to overcome the habit. Local groups meet weekly in various towns in U.S.A. and Canada to discuss their problems in the light of the very broad religious tenets and conduct on which the movement is based. The number of people who have benefited through "Alcoholics Anonymous" now, according to reliable testimony, runs into thousands

J H Wall and E B. Allen<sup>5</sup> have reviewed the results of treatment in 100 alcoholic men admitted to a large private mental hospital. They found that 24 per cent of the men were still abstinent three to eight years after discharge from the hospital, and 19 per cent more were managing their lives far more satisfactorily than hitherto, in other words, nearly half the patients had been benefited by treatment, which was along broad psychiatric lines including psychotherapy. As these men were a particularly difficult group, who had been forced into a mental hospital because of the serious consequences of their alcoholism, the results must be regarded as satisfactory.

-M M Miller<sup>6</sup> agrees with W Bloomberg and other American writers<sup>7</sup> that benzedrine has value in the treatment of chronic alcoholism. Miller treated 56 such patients with benzedrine shortly after an alcoholic bout; the dose was 10 mg by mouth twice daily, supplemented with 1½ gr luminal at night, and thiamine daily. The results were found satisfactory in a majority of the patients, to the extent that they stopped drinking for the time being and sometimes for as long as eighteen months, and it was possible to initiate a programme of rehabilitation for them which would otherwise have been impracticable. Miller assumes that the benefit of benzedrine is during the 'hang-over' phase

REFERENCES — Amer J Psychiat 1944, 100, 443, Ind. 762, Brit med J 1944, 2, 368 Amer J Psychiat 1944, 100, 468, Ind. 474, Ind. 800, Ind. 1942, 98, 562

SPONDYLITIS. (See Chronic 'Rheumatic' Disorders)

#### STILBŒSTROL AND CANCER.

Str Walter Langdon-Brown, M.D., D.Sc., F.R.C.P. Samuel Leonard Sympson, M.A., M.D., F.R.C.P.

Experimentalists have noted for several years the production of innocent and malignant tumours in small animals, e.g., mice, if subjected to continuous treatment over long periods with cestrogens, natural or synthetic. E. Allen¹ has summarized the more important work on experimental animals. He finds that the genital organs are involved primarily, but non-genital tissues are also affected. Thus the following definite effects were obtained.

- 1 Cancer of cervix uteri in mice
- 2 Uterine fibromyomas in guinea-pigs
- 3. Mammary cancer, especially in mice
- 4. Interstitial cell tumours of the testes in mice
- 5 Adenomatous tumours of the pituitary in rats and mice
- 6 Tumours of the suprarenal cortex in mice (These may occur spontaneously after ovariectomy, with evidence that the tumour secretes cestrogen)
  - 7 Osteogenic transformations of bones, including tumours in mice

Some "atypical growths" were the following -

- 1 Cystic hyperplasia of the endometrium in several species.
- 2 Metaplastic changes in parts of the male accessory organs, e.g., prostate
- 3 Lymphatic leukæmia (as lethal in mice as in man)
- 4 Hypertrophy of the bile-ducts in mice
- 5 Cystic ovaries in several species

However, in spite of this experimental evidence, there has been no clinical evidence in the human species that cestrogens do produce malignant changes, although endogenous cestrogens may well be responsible for spontaneous innocent tumours such as uterine fibromas and breast adenomas. In practice, no clinician withholds cestrogens when they are indicated for endocrinopathies, e.g., climacteric symptoms, amenorrhea, but the dose advocated is the minimal that will abolish or minimize the symptoms, this being rightly regarded as physiological substitution therapy. Nor is there any evidence that the cheaper and equally effective synthetic cestrogens, e.g., stilbæstrol, hexcestrol, and diencestrol, are likely to be potentially carcinogenic as distinct from the natural cestrogens, e.g., cestradiol. There is, therefore, no clinical evidence to suggest that the clinician is not fully justified in using cestrogen therapy for fear of a possible remote carcinogenic effect.

More recently, however, another aspect of the subject has become important, namely, the claim that stilbostrol can ameliorate, and in some cases apparently cause to disappear, even if only temporarily, malignant disease of the breast and

prostate in the human species This might appear to be a complete paradox on first thoughts, but one of us (S.L.S.) was surprised, on a visit to the radium mines in Czecho-Slovakia, to find a high incidence of carcinoma of the bronchus among the mine-workers, so that it would not be a precedent for a carcinogenic agent also to be potent as a destroyer or inhibitor of malignant growth A Haddow and colleagues<sup>2</sup> also observed experimentally that many carcinogenic hydrocarbons possess the property of retarding the growth of malignant tissues

The use of stilbæstrol and other æstrogens for the mitigation of cancer of the prostate is, however, based upon physiological grounds, although other less obvious factors may come into action All experimentalists know that castration leads to failure of development, or involution, of the prostatic gland. and that conversely testosterone injections in the immature animal will produce hypertrophy of the prostate In fact, over 150 years ago John Hunter pointed out that the prostate owes its activity to the existence of the testicles, and that their removal caused atrophy of the gland Further, complete orchidectomy for the relief of prostatic cancer was practised by many of the older surgeons, although the operation fell into disuse, probably because of the lack of any ultimate benefit, and the psychological repugnance that the idea pro-However, there has been a revival of this procedure Thus R M. Nesbit and R H. Cummings' reported on 75 cases of carcinoma of the prostate treated by orchidectomy, and observed for periods of at least six months. Although no "cures" were claimed, favourable subjective and objective responses were obtained in no less than 73 per cent of patients. In a follow-up of this series,4 they reported "forty-five per cent of the patients remain free from symptoms 21 to 36 months after orchidectomy, but 21 patients previously reported as showing favourable response have had recurrent symptoms of advanced disease and several of these are dead" The increasing incidence of delayed failure in this series suggests that eventually all cases may fall into this category H L Kretschmer<sup>5</sup> reports a disappointing series of cases, and judged by the strict criteria usually applied to alleged remedies for cancer. finds orchidectomy a disappointing procedure except for transitory amelioration in some patients. Other papers have appeared, including those of C. Huggins and colleagues and T J D Lane, and the evidence tends to show that temporary amelioration occurs in 50 per cent of patients, as evidenced by improvement in general health and well-being, improvement in the consistency and mobility of the prostate, decrease in dysuria, and striking and rapid relief from pain due to secondary growth in the bones, etc.

Physiological castration can be produced by cestrogens, both experimentally and in man In normal individuals libido disappears and the number of spermatozoa in the ejaculatory fluid decreases to vanishing point with sustained administration of stilboestrol, an effect which is apparently reversible. complete recovery of function and morphology following the cessation of therapy. The mode of action is by inhibition of the pituitary gland, especcially of its gonadotrophic function. It was therefore eminently rational to substitute stilbostrol (or other estrogen) therapy for surgical castration in an attempt to ameliorate the clinical condition associated with carcinoma of the prostate; but if this is the only action of stilbæstrol, it would not be justified to expect results of greater value than those obtained with surgical castration. We will consider the numerous clinical reports, but on the whole they suggest a similar character to those obtained with surgical castration, although some workers in this field have made optimistic claims, even over long periods. Initial work with cestrogens in carcinoma of the prostate is usually attributed to Huggins and Hodges, but in a letter to the Journal of the American Medical

Association, Herbst9 points out that in a previous month he read a paper on the subject to the American Urological Association, and a summary of his results appeared in the Journal of the American Medical Association in 1942 10 Several other papers appeared in America (C. Huggins, 11 C. Huggins and colleagues,12 and R D Herrold18), and in this country (J D Ferguson,14 K Walker, 18 E C Dodds, 18 and G H. Duncan 17) There is general agreement among most observers. The dose of stilbæstrol is 3 mg daily for some two months, and then reduction to 1 mg daily Some two-thirds of the patients respond, and benefit is shown by diminution or disappearance of pain on micturition, and pain associated with bony metastases, decrease of frequency, decrease in size and fixity of the prostatic gland, increase in weight and well-being, decrease in size of bone, pulmonary, and spinal metastases, and occasional disappearance of superficial subcutaneous metastases In view of the misquoted review by Professor Dodds of this field of cancer research, it is important to record that he stated "no single member of the workers in this field has ever claimed a cure ". It is true that clinical regression and a stationary condition of well-being has been observed for two years, but nothing under five years can be considered as adequate evidence, even of permanent regression, when dealing with carcinoma of the prostate

Disadvantages of the therapy are enlarged painful breasts (gynæcomastia). disappearance of libido and potency, a diminution in size of the penis and testicles, and sometimes cedema of the ankles and lower limbs All these, as well as hot flushes, occur with castration therapy. One patient treated with cestradiol dipropionate developed a purpuric syndrome, which was controlled by 1 g of calcium gluconate by mouth, t d s. Huggins, in his original papers, pointed out that the enzyme phosphatase is apparently secreted by the epithelial cells of the prostate (normal values up to 35 units per 100 c.c serum), that it is considerably increased in carcinoma of the prostate (usually above 10 units), and that stilboestrol therapy, as well as castration, will produce a return to normal levels, the estimation of serum acid phosphatase thus affording a method of controlling dosage and progress Radiation of the testes (radiation castration) has often been advocated as an alternative method for the control of carcinoma of the prostate. Experimentally it is easy to destroy the spermatic tubules by radiation, but not the interstitial cells, which secrete testosterone Huggins found that radiation of the testes was "inadequate as a therapeutic agent in prostate cancer in man" He also observed that if there were an unsatisfactory response to surgical castration, the addition of stilbæstrol therapy was of no avail This seems to confirm the view that stilbæstrol acts by producing physiological castration and not by direct action It is important to remember that androgens are secreted by the adrenal cortex as well as by the testes, and it is theoretically possible that removal of the adrenal glands (or one of them) might enhance the effect of stilbostrol or surgical castration It has been observed that testosterone administration increases the serum acid phosphatase as well as aggravating the symptoms in prostatic cancer In general, one can conclude that it has been proved possible to mitigate the symptoms and prolong life and well-being in patients with carcinoma of the prostate, but as yet "cure" cannot be claimed

The theoretical aspect of the relation between prostatic enlargement, the testes, and stilbœstrol, is further complicated by the fact that being enlargement of the prostate has been treated both by testosterone and by stilbæstrol, and good results claimed. The literature on testosterone has been reviewed in previous editions of the Medical Annual, and one of us was a member of a Committee of the Medical Research Council which organized extensive clinical trials and controls, and was unable to consider as proved the claim

that testosterone was of real value in benign enlargement of the prostate Nevertheless, many clinicians continue its use on the theory that the prostate becomes enlarged in old age as testicular function fails, and because they obtain symptomatic improvement. Stilbœstrol is used on similar theories as those considered above for carcinoma of the prostate, and in a recent paper, J. P. Skibba and R. Irwin<sup>18</sup> claim good results. (See also Prostate.)

The treatment of cancer of the breast by alteration of hormone balance, has followed similar lines to those of cancer of the prostate Thus, Sir George Beatson, 10 at the end of the last century, assumed that the cause of mammary carcinoma lay in the ovaries, and advocated opphorectomy as an ameliorative measure At first several surgeons reported enthusiastic results, but the operation eventually fell into disuse In 1905 Hugh Lett<sup>20</sup> reviewed 99 cases of inoperable carcinoma of the breast in women who had had oophorectomy. and failed to find more than one case in which permanent arrest of the disease could be claimed, although spectacular immediate response was witnessed in several cases Experimentally, there is no doubt that development of the breast depends in large measure upon the secretion of cestradiol and progesterone by the ovaries and that oophorectomy produces involution of normal breasts A Lacassagne<sup>21</sup> showed that the latter was true also for colonies of mice in which carcinoma of the breast was found, diminishing the incidence of carcinoma in the colonies, and further he showed that injections of testosterone could produce similar results by inducing a physiological castration through pituitary inhibition A A Loeser<sup>22</sup> implanted tablets of testosterone subcutaneously in women who had had their breasts removed for carcinoma, and considered that short-time observation indicated that this procedure might be of use in preventing recurrences P Ulrich23 injected 10 mg of testosterone propionate daily in a woman with painful carcinoma of the breast and found that the growth became softer and more supple and pain decreased. E Fels,24 in a series of such cases, reported subsidence of pain, disappearance of palpable nodules, and diminution of skeletal metastases No "cures" have been claimed That testosterone, by injections or subcutaneous implantation, can produce physiological castration in woman is beyond doubt, but the effect is temporary and is associated with hirsutism and acne, and, apart from this, it cannot be expected to achieve more than the admittedly disappointing procedure of surgical or radiation castration

More recently, however, a series of reports have appeared, claiming good results from the use of stilbostrol in breast cancer, a procedure the rationale of which it is difficult to conceive Thus R T Edwards25 recorded what appears to be a well-documented case of carcinoma of breast, which was operated upon and sectioned, and subsequently had metastases in the skin and neck, disappearing with 05 mg stilbæstrol daily for 24 days W. M. Biden<sup>26</sup> recorded a case of scirrhous carcinoma of breast in a woman of 78 which disappeared after giving 1 mg stilbæstrol t ds, the general condition of the patient improving enormously at the same time T D Brown<sup>27</sup> recorded a similar remarkable case with the tumour receding to very small dimensions. These, however, were all isolated cases More recently, Haddow. Watkinson, Paterson, and Koller<sup>2</sup> have investigated a large series of cases of late malignant disease of the breast at the Royal Cancer Hospital treated with synthetic cestrogens. "Of 22 cases of late malignant disease of the breast treated with the synthetic cestrogen triphenylchlorethylene (usually in doses of 3 to 6 g. per day), 10 showed a significant although temporary retardation, or even partial regression, of the growth of the tumour. No evidence was obtained to suggest that the drug will prevent the development of metastases. The initial effect of treatment in these cases passed off comparatively rapidly, and only one patient has shown prolonged arrest of the growth, the ultimate course of the disease being in no way altered in the remainder. The degree of retardation was less than could be expected from local palliative X-irradiation. Of 14 cases of carcinoma of the breast treated with stilbestrol (by intramuscular injection or by mouth over a period of several months), 5 showed alterations in the growth and behaviour of the tumour similar in nature to those produced by triphenylchlorethylene Serial biopsies in a few cases with a marked clinical response showed histological alterations (diminution of mitosis rate, variations of staining behaviour, and necrotic changes) of a type not resembling the changes following X-irradiation."

We therefore see that although temporary amelioration can be expected in a good proportion of cases, the care or even control of cancer of the breast by hormone therapy has not yet been achieved.

Extracts of the suprarenal cortex and of the parathyroid glands, in both cases not having the physiological hormone action usually associated with these glands, have also been advocated in various forms of cancer, but up to date the claims of a particular group of clinicians in each case have not been vindicated by a systematic study by a competent body of clinicians and pathologists.

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STOMACH, SURGICAL DISEASES OF. (See also Gastric and Duodenal Ulcer)

A. Rendle Short, M D., F.R C.S.

Gastric Folyposis.—Multiple polypi of the stomach are not common. In 1926, some 80 examples were culled from the literature by H Brunn and F. L Pearl 1 To this list they now add 41 more, including three of their own. They may be congenital or inflammatory. The symptoms are not characteristic there may be pain and tenderness, and often some bleeding, either hæmatemesis or melæna The diagnosis is given by the barium meal, but is common (19 of 37 recent cases) This confirms the opinion that partial gastrectomy is the best line of treatment

Hypertrophic Pylorus in the Adult.—About 100 cases have been reported, to which J E Berk and H. L Dunlop<sup>2</sup> add 2 more. The patients were males aged 39 and 37. The symptoms resemble those of peptic ulcer with pyloric obstruction. At operation, it is not usually possible to distinguish from a pyloric cancer, so resection is necessary.

Gastric Diverticula.—These are not very rare; at the Lahey climic 35 have been recognized. The commonest site is on the posterior wall near the cardia. As a rule, the symptoms are mild, and medical care will suffice. The diagnosis is given, of course, by the barium meal. Surgery is hazardous. (M. L. Tracey 3)

Carcinoma of the Stomach.—Every doctor realizes, or ought to realize, that this disease is common in men past middle life, that it is seldom cured by operation, and that the remedy is earlier diagnosis. Writing on this subject, I. W Held and I. Busch<sup>4</sup> point out that growths may arise in a previously normal stomach (70 per cent), or in a stomach already afflicted with ulcer, gastritis, or polyposis (30 per cent). Those in the second group are less

malignant as a rule. In the first group, the growth may commence in the cardiac end, the pars media, or the prepyloric region. Growths of the cardia are uncommon; deglutation may be interfered with, but demonstration by the barium meal is difficult. In growths of the pars media, there may be no striking symptoms until a lump can be felt. Epigastric fullness, belching, and loss of appetite are usually complained of, if asked for If the growth involves the posterior wall alone, there may be pain in the back, perhaps severe, but the barium meal may be entirely negative. Prepyloric cancer, in early cases, causes but little in the way of symptoms, but the barium meal rushes through the rigid pylorus in a characteristic manner. It is important to remember that in not a few patients with carcinoma of the stomach, especially in the younger age-groups, the gastric acidity may be normal.

Fordyce B St John and colleagues, of New York, are hoping to improve the outlook by undertaking mass radiology of large sections of the population, without regard to presence or absence of complaints of dyspeptic troubles. They caught 3 cases, who had noticed no symptoms at all

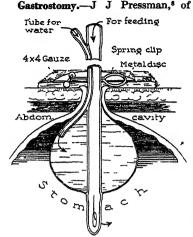
Total Gastrectomy for Cancer.—A collective review of the literature, with an original report on 20 cases, is furnished by G T Pack and Gordon McNeer. of New York The first successful case on record was by Schlatter, in Switzerland, in 1897 The conservative surgeon can always present several logical reasons for not attempting an operation of this magnitude. The high immediate mortality, the numerous and distressing post-operative complications, the short survival periods of those patients who recover from the operation due to the high incidence of recurrence of the cancer or the late appearance of distant metastases, the consequent low rate of curability, and the occasional unpleasant dietary and digestive discomfort and the limitations during the months of life salvaged by this procedure present a gloomy picture indeed The same handicaps, however, attended the early history of operative procedures for cancer in other organs, and it is reasonable to believe, therefore, that improvement in operative mortality and end-results will follow the more general employment of this operation

Recently, some surgeons have been experimenting with a trans-thoracic, trans-diaphragmatic approach. Different surgeons have used different methods. Esophago-jejunostomy is much superior to esophago-duodenostomy. In 8 recorded cases, all fatal, the esophagus and jejunum could not be brought together. It is probably better to make an opening between the ascending and descending loops of jejunum, but not all surgeons agree. It is undoubtedly safer to feed the patient for 8 or 10 days after operation, through a jejunostomy, or a Levine tube may be passed down the esophagus, through the anastomosis, into the jejunum. The recorded cases were 294 in number, with a general mortality or 374 per cent; the latest figures show no great improvement.

Various metabolic deficiencies are likely to follow the operation—hypoproteinæmia, deficiency of prothrombin, hypochromic anæmia Patients usually lose weight, which may be due to steatorrhæa.

About 50 cases were reported to be alive and free from cancer, half of them under and half over a year. Three patients were alive over four years, one of them over eight years. [This is a very full and instructive paper—A. R. S.]

At the Lahey clinic? 78 of these operations have been performed, and in the last two years the mortality had been reduced to 18 per cent. "Few, if any, cures will result from total gastrectomy except possibly in the leiomyosarcomas". They have one patient alive and well after four and a half years, and another after six years.



Gastrostomy.—J J Pressman,\* of Los Angeles, finds that leakage from a gastrostomy can be prevented by inserting into the stomach, through the opening, a Foley catheter with dilatable latex rubber bag, such as is used to fill the prostatic cavity after prostatectomy

Fig 42—Schematic drawing to illustrate sagittal section through stomach, site of gastrostomy, and dilated occluding bag in situ (Reproduced from 'Surgery, Gynecology, and Obstetrics')

Gauze is laid over the wound around the catheter, then a metal disc, then a spring clip, to keep the latex bag in contact with the opening in the stomach wall (Fig 42)

REFERENCES — Surg Gynec Obstet 1948, 76, 257, \*Ann Surg 1944, 119, 124, \*Gastro-enterology, 1943, 1, 518, \*Ann untern Med 1943, 18, 719, \*Ann, Surg 1944, 119, 225 \*Surg Gynec Obstet 1943, 77, 265, \*Ann Surg 1944, 119, 300, \*Surg Gynec Obstet 1943, 77, 421

#### STRONGYLOIDIASIS.

A E Barnes, MB, FR.CP

Strongyloidiasis in man has been reported from Australia by T. E. Lowe and H. C. Lancaster, who describe a series of 16 cases. As the parasite occurs and has caused fatalities in Germany as well as in the tropics, it may be worth devoting a few lines to recapitulate the chief features. Sistercoralis (described in older books as Anguillula intestinalis, which represented only one stage in the life history) has a life cycle like its near relative Ankylostomum. It penetrates the skin from infected mud or water, traverses the lungs and trachea causing symptoms thereby, and so reaches the intestines. It may cause skin lesions—local erythema with petechiæ and sometimes urticaria, in the lungs, alveolar lesions from which the larvæ may penetrate the pleura and pericardium, causing effusions, in the intestine, the adult females penetrate the mucosa and traverse the submucosa, causing ulceration and an enteritis which affects both the small and large intestine, in the blood there is a pronounced eosinophilia. The lung lesions often produce increased bronchovascular markings in radiographs, as was demonstrated in these cases.

Diagnosis—This depends on demonstration of the larvæ in the fæces Emerson<sup>2</sup> recommends cultivation by the simple method of making a depression in a small mass of fæces, incubating, and then examining the fluid for the motile worms, but Lowe and Lancaster give the following method. About one ounce of the fæces to be examined is mixed with an equal quantity of moist garden soil, previously sterilized by being boiled. The mixture is then placed in a small jar, such as a 2-oz. 'Vegemite' pot, and kept in a warm dark spot for seven days to allow larvæ to grow and eggs to hatch. At the end of this time, the mouth of the jar is covered with a piece of linen or multiple layers of gauze, held in place by a rubber band. A 6-in filter funnel with a short rubber tube and clip attached is filled with water at 55° C. and held vertically in a clamp. Into this filled funnel the covered jar is inverted, so that the linen cover just touches the water. If present, larvæ may often be seen with the naked eye migrating to the warm fluid in the funnel. After one hour, 5 c c.

of fluid are drawn off through the rubber tube on the funnel, and centrifuged The deposit is examined microscopically for larvæ or adult worms

TREATMENT—Gentian violet in enteric-coated capsules of 1 gr., three times a day for eight days, relieved the symptoms but did not remove the whole infestation thoroughly. Foundin and emetine were tried without good results. They do not mention the use of sulphur as recommended by C. W. Stiles, 5-15 gr., t.d.s., in capsules with equal parts of sugar of milk

REFERENCES — Med J Aust 1944, May 13, \*Clinical Diagnosis, 1921, \*Osler and McCrae's System of Medicine, 1915, 2, 287

#### SUBARACHNOID HÆMORRHAGE, SPONTANEOUS.

Macdonald Critchley, MD, FRCP

The subject of congenital intracranial aneurysms is a fascinating one Although, since the work of C P Symonds, 1, 2 we can regard the clinical effects of rupture of one of these vascular anomalies as forming one of the prettiest and clearest-cut syndromes in medicine, there are a number of problems as yet unsolved which concern the pathogenesis of the aneurysms, their pre-rupture symptoms, the role of cranial trauma in causing rupture, and the prognosis in non-fatal cases

C Gaulter Magee's paper<sup>3</sup> is of importance in that it deals with some of these obscurer aspects. By virtue of his work with the Ministry of Pensions, Magee has been able to analyse the records of 150 cases of spontaneous subarachnoid hæmorrhage occurring mainly in Service personnel (and hence largely in young male adults). Of his series, 6 per cent occurred in subjects under 20, 50 per cent were aged 21–30, 37 per cent were aged 31–40, and 6 per cent were over 40. In the 21–30 age-group, recurrence followed in 33 per cent, death in 48 per cent, and a good recovery in about 35 per cent. The results were rather less favourable in the 31–40 age-group, where recurrence followed in 37 per cent, death in 66 per cent, and a good recovery in only 27 per cent. Good recovery was rare in the 41–50 age-group

After strict inquiries into the circumstances preceding the onset of rupture symptoms, only in 8 out of the 150 cases did a comparatively minor trauma seem to play an aetiological role in the production of intracranial bleeding Symptoms developed in under five minutes in 3 cases, in under three days in 3 more; and in under a week in one case

In 15 cases only was there any claim that physical strain, in the wider sense of the word, played any part. Four of the subjects were playing football (this number does not include 2 others who headed a wet ball and are included under "trauma"), 2 were cycling, 2 were doing P.T., 1 was pulling a heavy canvas cover over a lorry; 1—a furniture remover—was carrying a heavy chest; a soldier collapsed on a cross-country run, and another while lifting a cart wheel. In 3 other cases there was a more delayed association between strain and rupture symptoms. One patient developed symptoms in the evening following a full day's military training, 1 was associated with hard work as a stoker, and a third occurred in an army baker, accustomed to lift heavy weights and to perform strenuous acts of kneading.

On the other hand, in the remaining 185 cases (or 90 per cent) the patients could assign no special cause for the onset of their symptoms. In 48 of them there was a clear and definite history of onset in bed, or while rising, or in the home, office, or cinema

As regards pre-rupture symptoms, 18 patients only gave a story of headaches, in 9 of whom the label 'migraine' had been applied. Three of these were instances of ophthalmoplegic migraine, with headache followed by ocular palsy. The author analyses the clinical features of the 150 cases — It is interesting to note that albuminuma, often massive, occurred in 15 cases, and glycosuma in 7

The death-rate was 56 per cent, i.e., 84 out of 150 cases. When the symptoms are analysed in relation to the mortality, it is difficult to select any group of symptoms or signs as indicative of a grave or favourable prognosis. The possible exception consists in the slight worsening of the outlook when there is loss of consciousness (and especially when coupled with vomiting)

Table I.-LATENT PERIOD IN 50 RECURRENCES

PERIOD WITHIN WHICH RECURRED (WEEKS)	Cases	DIED	Period within which Recurred (Weeks)	Cases	Dred
1 2 8 4 5	4 9 12 7 4	3 5 8 7	6 7 8 over 8	4 3 0 7	2 1 0 5

Table II -FOLLOW-UP IN 22 CASES

CASE	Interval (Montes)	Remarks	PRESENT COMPLAINT		
1	15	Working as school attendance officer	Sense of lightness in the head		
2	8	Working in a factory	Headache on waking, occasional		
8	12	Working	Attacks of right frontal headache		
4	12	Three weeks' work only	Constant pain in head, photo- phobia, blepharospasm		
5	8	No record of work	Occasional headaches, poor mem- ory, exophthalmos, no thyroid enlargement		
6	6	Half-time work	Headache, listless, improving		
7	12	Baker, no loss of time since recovery	No complaints		
8	18	At former job without loss of time since recovery	Headache, lassitude, improving		
9	18	Munition worker, no loss of time since recovery	Pain in back		
10	24	Not worked	Headache, dizziness		
īĭ	24	Doing important job	Great improvement		
îž	12	Working as messenger	Right-sided headache		
18	6	No record	Feels fit		
14	6 6 12	No record	Slight backache		
15	6	Working as accountant	No complaints		
16	12	Not working	Hemiplegia		
17	18	Cannot keep a job	Headaches, giddiness		
18	24	No work	Constant headache		
19	6	Working as clerk	Still has headaches		
20	6	Cashier, has worked without loss of time since recovery	Headaches, poor memory,		
21	48	Working as a barman	Continuous headache		
22	18	Presumed working	Very slight headache		

At the post-mortem examination of 58 cases, a ruptured aneurysm was found in 43. The anterior portion of the circle of Willis was the site of the aneurysm three times as often as the posterior part. Two aneurysms were found in 2 cases, three aneurysms in 1 case, and "several" aneurysms in another. The right half of the circle of Willis was involved twice as often as the left.

Special attention was paid to the question of recurrence. This occurred in 50 of the 150 cases. But as 52 patients in the series died in their first attack of subarachnoid bleeding, the 50 recurrences must be recalled as occurred

from the remaining 98 cases The latent period between the first and second hamorrhages is commonly a matter of three weeks, as shown in the author's table  $(Table\ I)$ 

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Of the author's series, 105 out of 150 either died, or were seriously incapacitated by sequelæ It was possible to follow-up 22 cases at periods varying from 6 months to 4 years afterwards. The results may be quoted as from the author's tabulation (Table II).

In discussing the problem whether physical strain or exertion can fairly be invoked as the cause of rupture of an aneurysm, or of a recurrence, the author concludes against such a causal connexion. "The emphatic testimony against stress and strain in the production of the primary attack seems to be underlined by the observation on recurrences, and it seems logical to propound that if these factors play no part at the end they can also be exonerated at the beginning. Indeed, as between rest and effort this series suggests that the former deserves the greater share of blame."

REFERENCES — Guy's Hosp Rep 1923, 73, 139, Quart. J Med. 1924, 18, 93, Lancet, 1948, 2, 497

#### SULPHONAMIDES IN DERMATOLOGY.

R. M B MacKenna, M A., M D, F.R C P.

In dermatological practice the use of drugs of the sulphonamide series has so far progressed that a critical assessment of their worth is permissible and helpful Such an evaluation has been written by H W Barber, and his views have received a large measure of confirmation and support.

As is well known, sulphonamides are effective in the treatment of certain diseases of the skin, both when given internally and applied locally; but both methods of administration demand the most careful surveillance lest allergic hypersensitiveness of the skin and other tissues develops or serious toxic effects occur

Local Application.—Barber emphasizes that there is a remarkable difference of opinion concerning the efficacy of sulphonamides as local applications in diseases such as impetigo, there is also dispute concerning the risk of sensitization that such treatment entails. He expresses the doubt, shared by many other dermatologists, whether the use of these drugs as local applications in superficial infective dermatoses, such as impetigo contagiosa, possesses any advantages over rational treatment with older and safer remedies. A similar view has been forcibly expressed in the Bulletin of the Army Medical Department.<sup>2</sup>

In recent months many practitioners and medical officers have expressed their difficulty in understanding why it is that the use of sulphonamides for local application is recommended for the treatment of burns, extolled in certain surgical procedures, and criticized in dermatological practice. The explanation of this paradox is that an eczematous reaction is chiefly a manifestation of epidermal sensitization. This type of reaction—and it is the common manifestation of sulphonamide sensitivity—cannot occur in surgical conditions or in the majority of burns when the epidermis is completely destroyed, but in many skin diseases the deeper layers of the epidermis are bereft of the protection afforded by the stratum corneum, and Barber avers that it is the repeated contact of the sulphonamides with the cells of the Malpighian layer that produces the eczematous response Hence, the risk of producing serious complications by a local application of sulphonamides is much greater in the treatment of cutaneous diseases than in the treatment of surgical conditions. The hazard of sensitization appears to be greater in subtropical or tropical climates

Local applications of sulphonamides may give rise to three types of sensitization-local sensitization, general sensitization, and photo-sensitivity local sensitization occurs the true nature of the eczematous reaction is difficult to discern, although this fact is usually not sufficiently emphasized, if, for example, an impetigo is being treated with sulphonamide paste, when local sensitization develops the impetigo appears to get worse Unless he is alert to the dangers of sulphonamide medication, the clinician may be hoodwinked into believing that the paste is not being properly used, and that the sulphonamide is not getting sufficient access to the lesions, therefore, he may intensify therapy by increasing the amount of sulphonamide in the paste, or by ordering that sulphonamide powder be sprinkled on to the lesions before the paste is applied Either of these two courses is disastrous. As a general rule, if there is an apparent exacerbation of the lesions when a patient is receiving local sulphonamide therapy, the use of sulphonamides should be stopped at once and an alternative treatment prescribed General sensitization is usually accompanied by exacerbation of the local lesions, fever, facial cedema, severe pruritus, and a generalized rash, which may be erythemato-macular or vesicular, occasionally a pemphigus-like eruption develops Photo-sensitivity leads to the development of severe sunburn effects of areas on skin exposed to minimum degrees of sunlight

Increased sensitivity to one compound is usually, although not invariably, associated with an increased sensitivity to other sulphonamides

When sulphonamides are required for dermatological purposes, they should not be applied to the skin or given by the mouth continuously for longer than a week. If sulphathiazole is given by the mouth it may be best to limit the administration to a period of four days. These are general rules based on wide experience, but B C Tate and I Klorfajn³ have noted that even such stringent restrictions may not be true safeguards, for in 30 cases in which sulphonamide sensitization occurred they noted that in 37 per cent the dermatitis developed within 4 to 7 days of commencement of treatment. They also noted that in patients who had had sulphonamide dermatitis and had recovered, the administration of a small dose of sulphanilamide, sulphapyridine, sulphathiazole, or sulphaguanidine provoked a relapse of the dermatitis

Most authorities agree that whilst the photo-sensitivity which may occur from sulphonamide administration is not permanent and usually disappears in time-often after a period of months-the two other types of sensitization are probably permanent Thus the indiscriminate use of sulphonamides in the treatment of relatively trivial skin diseases may, at a later date, jeopardize the lives of these patients by precluding the use of these drugs, should they be wounded or develop pneumonia 

For these reasons Tate and Klorfajn believe that topical sulphonamide therapy for skin diseases and minor injuries is unjustifiable, and should be discontinued Eczematous subjects are particularly hable to sensitization, and sulphonamides should seldom, if ever, be applied to their skins, great care should always be taken if it is necessary to administer sulphonamides by the mouth to such persons local therapy with sulphonamides is to be employed, it is probable that sulphadiazine is the safest drug of the sulphonamide series for the purpose Barber avers that sulphadiazine cream has been used almost as a routine application for impetigo in the American Army, and quotes Colonel D M Pillsbury as stating that sensitization to this drug is rare either when applied locally as a cream or when given internally

In a later paper B. C Tate and I. Klorfajn\* claim to have shown that epidermal sensitization caused by the local application of sulphonamides to the skin can be successfully prevented or treated by giving the same drugs

orally They state that if whilst local therapy is being applied, oral therapy is maintained, sensitization does not usually occur provided the oral therapy continues for two weeks after completion of the treatment, a dose of 0.25 g twice daily usually is adequate. They recommend that if an attempt at desensitization is to be made, the clinician should wait until all signs of the original eruption have disappeared, then 1/2 g sulphonamide is given as a The dose is continued, twice daily, if only slight or moderate preliminary test symptoms ensue, but reduced if the reaction is severe. When the resulting eruption has disappeared, or nearly disappeared, the dose is doubled, and when any further reaction has died down the amount is again increased soon as the increment fails to cause a reaction, the patient is tested he receives 2 0 g followed by two further doses of 1 0 g at 4-hourly intervals If no reaction occurs he receives treatment for a further fourteen days, during which period he takes the dose which was being taken immediately before the negative test was obtained Treatment is then discontinued for 10 days, and the patient is re-tested with a large dose to make certain that the desensitization This method of desensitization obviously has certain hazards, and the blood of the patient must be carefully watched It is not a measure to be lightly undertaken by the inexperienced or without full assessment of the case

Oral Administration.—Tables I and II have been constructed by H W Barber to include the majority of skin diseases for which oral administration of sulphonamides may justifiably be given, or has been rationally tried author emphasizes that the dosage and duration of treatment must obviously depend upon whether the disease is acute or chronic. In acute diseases full doses are given on the first day of treatment in order rapidly to obtain an adequate concentration of the drug in the blood The doses are spaced in such a way that adequate concentration is maintained, the dosage is reduced slightly on subsequent days, and administration of the drug is discontinued after three or four days if the desired effect has been obtained, and in any case after a For example, Barber recommends the maximum of seven days' treatment following scheme of dosage to be used in selected cases of acute severe impetigo contagiosa 2 g sulphathiazole with a tumbler of water at 8 a m, 4 p m, and at bedtime on the first day, and 11 g at the same times on each of the two or three succeding days—a total of 15—19½ g being thus administered In cases of chronic infection, usually it is best to give a short intensive course of treatment for a week or less, as for acute infections, and repeat this periodically, rather than give small doses of the drug for relatively long periods, e.g., 14-21 When repeated courses of sulphonamide therapy are prescribed, careful supervision of the patients, including blood examinations and tests of the urine for evidence of hepatic or renal damage, must be maintained Before prescribing any of the sulphonamides, a careful case history must be taken to ensure that the patient has not previously suffered from ill-effects from their administration, if the history is dubious or inconclusive, it is best either to omit sulphonamide therapy, or else, after explaining the risk to the patient and obtaining his consent, to give a small test dose and note the effect carefully In dubious cases patch testing to determine sensitivity may not be of much assistance Tate and Klorfain have indicated that a negative patch test does not necessarily mean that the patient is not sensitized to sulphonamides, and therefore in a case of suspected allergy reliance must not be placed on a negative result of such a test

### SULPHONAMIDE TREATMENT OF TYPICAL CONDITIONS

A few notes concerning sulphonamide therapy in three special diseases of the skin may be added. The first illustrates the great diversity of opinion concerning this matter, to which attention has already been drawn

Table I—Oral Administration of Sulphonamides in Infections of the Skin

Micro-organism	DISEASE	RESULTS OF TREATMENT		
Acute Infections.—				
Streptococcus	Impetigo contagiosa	Favourable		
	Erysipelas	Favourable		
Staphylococcus	? Pyoderma gangrenosum Furuncle and carbuncle	Uncertain (sulphathiazole drug		
	Granuloma pyogenicum	Good result reported, but hardly indicated		
	Circinate and bullous impetigo	Good results reported with sulphathiazole		
Diplococcus (Bulloch, Demme)	Pemphigus acutus	Good results reported		
Bacillus of swine erysipelas	Erysipeloid	Favourable		
Bacillus of Ducrey-Unna	Chancroid	Favourable		
? Vacciuia virus	" Milker's nodules "	Good result reported		
Chronic Infections,—				
Streptococcus	Relapsing lymphangitis with	Good results obtained, but		
	or without elephantiasis Chronic streptococcal derma-	uncertain		
	titis with intertrigo	Good results obtained, but		
•	Ecthyma.	Seldom indicated		
Staphylococcus	Sycosis barbæ	Good results reported, but doubt- ful permanent effect		
	Pustular acne	Good results reported, but doubt- ful permanent effect		
	Hydradenitis suppurativa	Good results reported, but doubt- ful permanent effect		
	Infective eczematoid derma- titis	Good results reported, but risk of sensitization considerable		
Viruses	Lymphogranuloma venereum	Favourable if given in early stages		
	? Dermatitis herpetiformis	Sulphapyridine of striking value but effect apparently temporary		
	? Pemphigus vulgaris	Temporary improvement often occurs, and even apparent cures reported, but effect seldom lasting		
	? Pemphigus vegetans	Cures with sulphapyridine re- ported. other sulphonamides without effect		

Table II —ORAL ADMINISTRATION OF SULPHONAMIDES IN ERUPTIONS SOMETIMES OR ALWAYS CAUSED BY BACTERIA-EMIA OR THE CIRCULATION OF BACTERIAL TOXINS

ERUPTION	RESULTS OF TREATMENT	
Brythema multiforme Erythema scarlatunforme Brythema annulare centufugum Erythema induratum (streptococcal form)	When caused by acute or chronic strepto coccal infection may respond quickly, but treatment of closed foci infection essential	
Lupus erythematosus	The streptococcal form may respond well, but reactions often severe, par- ticularly in acute cases Removal of closed foci of infection should be effected first Tuberculous form non- responsive	
Pustular psoriasis and pustulăr basteride of the extremities	Apparently always due to bacterizems or toxemia from an acute or chronic streptococcal infection Sulphonamides of value in acute cases, and in chronic ones if the eruption does not respond completely after removal of closed foci of infection	

Impetigo Contagiosa.—Laurence Martin,<sup>5</sup> as a result of careful statistical analysis, avers that in the treatment of this disease a combination of oral and

local treatment with sulphathizole is very satisfactory, providing the usual precautions are observed; he emphasizes particularly the need to ensure that cases are true examples of impetigo and are not impetiginized eczematous eruptions. He finds the optimum oral dosage is 24 g in 4 days (i.e., 2 g thrice daily), and that 5 per cent sulphathiazole paste is probably the best local application. With this combined treatment cure is obtained in adult male (Services) cases in about nine days

Dermatius Herpetiformis.—Sulphapyridine is much more effective than sulphamlamide, sulphathazole, or sulphamezathine in controlling the eruption, but it does not cure the disease. Barber states that in some cases after an initial short course of full doses, he has kept the patient almost free of his eruption by prescribing one tablet daily or every second or third day, and no toxic effects have been observed. This observation has been to some degree confirmed by B. Barling, who has published the records of a case of dermatitis herpetiformis treated with regular doses of sulphapyridine for nearly four years with apparent benefit Barling, however, is careful to note that he has published this record with reluctance, because it would be regrettable if the success of this patient's treatment led others to carry out a similar therapeutic programme without the necessary safeguard of frequent blood-counts dence, therefore, seems to be accumulating which indicates that patients suffering from this disease may have a high tolerance to sulphonamide therapy, just as they appear to have a high tolerance to arsenic. This is offset by their sensitivity to iodine and iodides

Lupus Erythematosus.—In 1915, H W Barber suggested that some cases of this disease are tuberculous and others of streptococcal origin of the streptococcal form of the disease with sulphonamides may present features of great interest and difficulty owing to the severe reactions that may occur, and which were described by the same authors in 1941 Barber recommends that each case should be investigated fully to determine whether tuberculous or streptococcal foci of infection are present. If it is decided that the eruption probably is of streptococcal origin, the closed foci are dealt with, and a short course of full dosage of sulphonamides, for not more than one week, is instituted and repeated at intervals if necessary. He seldom undertakes such treatment in this disease unless the patient is prepared to remain in bed under close observation. He notes that in the acute form of the disease extreme hypersensitivity to sulphonamides is almost always present, and recommends that minute doses should be given at first until the patient's tolerance is determined Barber records an original observation, that the daily inunction of chronic patches of lupus erythematosus with 5-10 per cent ointment of sulphanilamide in landlin will, in some cases, produce striking improvement, which is usually preceded by a reaction in the affected areas He states that he has never seen epidermal sensitization result from such treatment

The whole position of sulphonamide therapy in dermatology will require fresh evaluation in a few years' time, when the value of therapy with pencellin and other antibiotics has been assessed. At present it seems that penicillin, which is safer to use and appears to carry little or no hazard of sensitization or of toxic effect to the kidneys or blood-forming organs, will supplant sulphonamide therapy in the treatment of many diseases, in view of the peculiar hazards of sulphonamide treatment which have been briefly discussed here, the more penicillin replaces sulphonamides in dermatological therapy, the better for the sake of the patients and the reputation of the therapists.

REFERENCES.—1 Practitioner, 1944, 152, 281, 2A M D. Bull. 1943, 29, 226, Lancet, 1944, 1, 39, 4 lbd 2, 553, Personal communication also cited by Barber , Lancet, 1944, 1, 503, But J. Derm. 1915, 27, 365, Idd. 1941, 53, 1, 38

#### SUPRA-LEVATOR ABSCESS.

W B. Gabriel, MS., FRCS

E A Gastorf and L O Warren¹ have recapitulated the details of the anatomy of the supra-levator space and comment on the rarity of supra-levator abscess Infection probably arises most commonly from the region of the anal crypts and by way of lymphatics extending laterally from the rectum, but in the majority of cases the route of infection remains undisclosed except in those cases where there has been a traumatic perforation of the rectal wall above the levator and

The clinical picture is described, particularly the early malaise and pyrexia with the gradual onset of pelvic discomfort. In men the inflammatory reaction frequently extends forward to the base of the bladder, causing urmary difficulty or retention. Rectal examination may reveal tenderness on one or other side or posteriorly, and later the rectal lumen may be markedly narrowed if the abscess surrounds the front and sides of the rectum. Leucocytosis is invariably present. The surgical approach for drainage is usually through the ischiorectal space with division of the fibres of the levator and in the anteroposterior direction to provide better drainage. In some cases the abscess may be drained into the rectal ampulla, but this should not be done if at the same time drainage via the ischiorectal space is required, since then there would be a serious risk of an ano-rectal fistula developing

The authors describe a typical case in a man aged 61 On account of gradual onset of low colonic obstruction with increase in abdominal tenderness a laparotomy was done, an inflammatory mass was found extending up from the pelvis, so a pelvic colostomy was performed. More than two weeks later the left supra-levator space was drained through the corresponding ischiorectal fossa. Still later, owing to imperfect drainage, an incision was made into the abscess cavity on the opposite side so that through-and-through irrigations could be carried out. Progressive healing took place and the colostomy was closed after an interval of 7 months

REFERENCE -1New Engl J Med 1943, 229, 613

#### SYMMETRIC LIVIDITY OF THE SOLES.

R M B. MacKenna, M.A. M.D. FRCP

In 1925 G Pernet¹ described under this title a condition characterized by livid or violaceous, cedematous, thickening of the skin, usually confined to the contact areas of the soles of the feet Often, as R. Klaber² has stated, there is a superficial stippled desquamation resulting in the appearance of numerous small shallow lacunæ on the surface of the affected zones, which may give a false appearance of vesicle formation J M Hitch and F Hansen³ described the same condition under the name "symmetric crythema of the soles"

Most of the authors who have written about the disorder have agreed that it is not as rare as the number of reported cases would indicate Recently L M Nelson<sup>4</sup> has drawn attention to the malady as seen in the US Army, and his experiences tally closely with those of Medical Officers of the British Army

Manifestations.—Hyperidrosis is a predominant feature, and the skin is wet and soggy with sweat Bromidrosis is a frequent concomitant. The erythema is vivid, so that the American term "scalded feet" is appropriate, and in some cases the inflammation spreads upward, forming a border round the sides of the feet and the backs of the heels which is about 2 cm. in depth. In many cases—as in that described by Nelson—the affected zones become white or violaceous in colour, and the erythema is confined to the margins of the lesions and the adjacent sites of pressure. The clinical picture is well illustrated by the photograph of one of Major E J Mannix's cases (Plate XLIII)

# PLATE XLIII

# SYMMETRIC LIVIDITY OF THE SOLES

(Major E J Mannix, RAMC)



Note the thickened, violuceous pluques at the sates of pressure, including the plantar surfaces of the toes. Note also the numerous shallow lacunge which are particularly well marked on the heels, and the crythema which extends along the outer part of the feet. (Colour photo by Hennell)



Aetiology.—The aetiology of the condition is obscure. The patient appears to be in good health, and the disorder is not associated with peripheral disease of the blood-vessels or with gross neurological maladies. Varying degrees of pes planus may be apparent, but flatness of the feet does not appear to be a major aetiological factor. Nelson states that, as far as is known at present, local infections with bacteria or fungi are not responsible for the condition, and he quotes Hitch, Hansen, and L. E. Nolan<sup>5</sup> in support of this statement. He regards the condition as a localized hyperidrosis which should be differentiated from other forms because of its characteristic clinical picture.

The malady appears to be more prevalent among soldiers who wear heavy boots and thick socks, long marches may play a part in the causation, but it would be reasonable to expect that if these factors are of great importance the incidence would be higher amongst recruits unaccustomed to strenuous exercise and the wearing of heavy footwear than amongst older soldiers, and, as yet, no evidence has been brought forward to suggest that the incidence is higher among recruits than among more seasoned troops. Some clinicians have drawn attention to the way in which the erythema is confined, particularly at the sides of the feet, to the area covered by the rubber soles of plimsols (gym-shoes), but confirmatory evidence has not been brought forward to suggest that the lividity is in fact associated with the wearing of rubber-soled shoes. For this, and other reasons, the tentative suggestion has been made that symmetric lividity of the feet is principally psychosomatic in origin.

Treatment.—The remedies used for treatment vary considerably, but most authorities agree that a period of rest in bed is usually necessary patients recovered when treated with a sulphur preparation and calamine lotion H J Parkhurst<sup>6</sup> relieved the condition by the use of 25 per cent solution of aluminium chloride Hitch and Hansen had success in one case with cold soaks of 2 per cent solution of aluminium acetate, also they employed weekly paintings with 40 per cent solution of formaldehyde, a method of therapy which W J O'Donovan' has stated to be most efficacious in hyperidrotic conditions of the feet. Nelson advocates daily soaking in 1-5000 solution of potassium permanganate associated with the use of drying dusting powders, of which the most effective consisted of 5 per cent powdered alum, 5 per cent tannic acid, and 10 per cent boric acid in talc Opinions vary as to the efficacy of sodium hexa-meta-phosphate, this may be used in a 10 per cent aqueous solution or applied as a dusting powder either undiluted or diluted with tale The reduction of this salt to powder is difficult, but is said to be assisted if the crystals are moistened with alcohol before pulverization

Prognosis.—Most dermatologists agree that the prognosis is surprisingly good, relapses being infrequent. In Nelson's series of 18 cases only one patient reported a recurrence, which was of mild severity

References —  $^1Brit\ J\ Derm\ 1925,\ 37,\ 123$ ,  $^2Ibd\ 1944,\ 56,\ 53$ ,  $^3Arch\ Derm\ Syph\ 1938,\ 38,\ 881$ ,  $^4Ibid\ 1943,\ 47,\ 822$ ,  $^4Cted\ bv\ Nelson^4$ ,  $^4Arch\ Derm\ Syph\ 1933,\ 27,\ 663$ ,  $^3Personal\ communication$ 

#### SYPHILIS. T Anwyl-Davies, MD, FR.CP.

The momentous discovery that penicillin in sufficient concentration has a lethal action both in vitro and in vivo on Sp pallida may revolutionize the treatment and prognosis of syphilis. Probably all types of syphilis, both acquired and congenital, early and late, including the difficult cardiovascular and neurosyphilitic cases, will be treated by the non-toxic penicillin, either alone or in combination with the orthodox drugs at present in general use. In America, Mahoney found that in early syphilis the immediate effects of penicillin are superior to those observed after arsenotherapy, and Stokes

reported excellent results in late syphilis at the recent annual meeting of the American Medical Association, when he showed slides of the handwriting of paretics to demonstrate their dramatic improvement from illegibility to clarity as treatment with penicillin progressed

Syphilite Angina Pectoris.—Evan Jones and D Evan Bedford¹ (London) investigated 103 syphilities who were subject to paroxysmal pain in the chest. There were 80 men and 23 women, a history of syphilis was obtained in 31 cases and 96 cases had a positive Wassermann reaction, 76 were subject to angina of effort, and 64 had pain apart from effort. Necropsy in 12 cases revealed the essential lesions of syphilitic angina to be acritis and acrtic incompetence, usually combined with stenosis or occlusion of the coronary ostia. They rejected the thesis of an atypical or pseudo-anginal syndrome due to acrtitis. Paroxysmal pain in syphilitic cases conforms to the recognized clinical varieties of angina pectoris in non-syphilitic coronary and acrtic disease. Acrtic incompetence and obstruction of the coronary ostia, which cause wide-spread cardiac ischæmia, predispose to pain. The horizontal posture appears to be an important exciting cause of nocturnal attacks.

#### TREATMENT

Penicillin and Early Syphilis.—The experience of C R Wise and D M Pillsbury<sup>2</sup> (U.S. Army) with penicillin in 15 cases of early syphilis has confirmed the earlier report of J F Mahoney, R C Arnold, and A Harris' on the rapid spirochæticidal effect of penicillin in man, the prompt regression of early lesions of syphilis, and the absence of significant reactions to treatment Two schedules of treatment were employed 5 patients received 20,000 units of penicillin intramuscularly every 4 hours, night and day, until a total of 1,000,000 units had been injected; 10 patients received 20,000 units 4-hourly until 500,000 units had been given In all but 1 patient spirochætes were not recoverable 14 hours after treatment was begun In this patient spirochætes were not demonstrable in a second examination 10 hours later The time to heal the lesions varied from 8 to 7 days, with a mean of 45 days. Penicillin offers great possibilities, as prolonged treatment with arsenic and bismuth is impossible under many war conditions, and the immediate effects of penicillin are superior to those after intensive arsenotherapy.

Under the auspices of the Medical Research Committee, USA, J E. Moore, J F Mahoney, W Schwartz, T Sternberg, and W B Wood4 have reported on 1148 cases of early syphilis treated in 23 clinics with penicillin It has a profound immediate effect in terms of disappearance of surface organisms, healing of lesions, and a trend towards serological reversal These immediate effects are, in general, brought about by 1,200,000 units 20,000 units intramuscularly every 8 hours, day and night, to a total of 60 injections in 71 days The incidence of relapse is in direct relationship to the total dosage given intramuscularly in a 7½-day period, greatest with 60,000 units and least with 1,200,000 units Relapse is more frequent after intravenous than after intramuscular penicillin, and its lowest incidence was in small groups of patients treated with 60,000 and 300,000 units respectively of penicillin plus a subcurative dose of mapharside Penicillin has a favourable effect in asymptomatic neurosyphilis, acute syphilitic meningitis, early syphilis resistant to arsenic and bismuth, and infantile congenital syphilis. The minimum dose, especially in secondary syphilis, should be not less than 1,200,000 units To reduce the relapse-rate the dose has now been doubled to 2,400,000 units in 7½ days.

Fenicillm and Late Syphilis.—J H Stokes, T H. Sternberg, W H Schwartz, J F Mahoney, J E Moore, and W B Wood<sup>5</sup> found that penicillin has distinctly beneficial effects on neurosyphilis Its action on gummata of skin,

mucosa, and bones is striking. In ocular syphilis, simple inflammatory processes respond, more complicated lesions such as optic neuritis and interstitial keratitis recover, relapse, and are resistant according to the damage already This is probably also true of visceral syphilis and of eighth-nerve These statements are based on 182 cases of late syphilis, includinvolvement ing 122 cases of neurosyphilis, observed from 8 to 214 days after treatment Gummatous lesions of skin and bone healed in from 12 to 46 days with a total dosage of 300,000 units Abnormal cerebrospinal fluids improved to some degree in 74 per cent and definitely in 33 per cent of cases One spinal In 30 cases of simple demented paresis 80 per cent fluid became normal improved, one case, with slurred speech, inability to write or do housework, was able to write legibly, drive a car, and do housework and shopping 4 months after penicillin, of 10 cases of deteriorated paresis, 2 improved 75 per cent, and 1 improved 50 per cent, one-fifth of 14 cases of tabes improved 50 per cent or more, and of 7 with lightning pains, 2 were completely relieved

Herxheimer reactions may be serious in late syphilis and should be guarded against by reducing dosage during the first 24-48 hours

Massive Arsenotherapy.—This has the advantages that every patient receives a sufficient amount of treatment for cure in 80 per cent of early syphilities, that completion of a minimum adequate amount of treatment does not depend on the patient's returning, and that on leaving hospital he is non-infectious and generally remains so Its disadvantage is the danger of an occasional severe toxic reaction that may rarely be fatal During 3 years of massive arsenotherapy by the 5-day continuous intravenous-drip method, B Craige and J F Sadusk<sup>6</sup> (New Haven) obtained satisfactory results in 79 per cent of cases, by re-treating selected patients the satisfactory results were raised to 87 per cent, 240 mg mapharside in 2400 c c of 5 per cent glucose were administered daily over a period of 12 hours for five days, making a total for each patient of 12 g of mapharside. In this small series of 74 cases of early There were no cerebral symptoms, syphilis, serious toxic phenomena were rare nitritoid cases, nephritis, or exfoliative dermatitis, no fatalities, and only one case of jaundice Drug fever occurred in many cases on the fourth to the sixth day, and vomiting in the afternoon of the first day Leucopenia was The primary or secondary lesions became negative on dark-field exam-Reversal of the serological reaction to negative mation within 24 hours usually occurred during the first 6 months, and in most cases between the tenth and twentieth weeks Thus, in early syphilis, this treatment is comparable with a year and a half of uninterrupted weekly injections by the alternating block method

H. Rattner' (Chicago) also gave the 5-day intensive treatment to 481 cases At first, mapharside was used alone and administered by of early syphilis continuous intravenous drip At the end of the first year, failures occurred in 12-15 per cent of cases, so the technique was modified to include a daily bismuth injection as well as the mapharside, this reduced the incidence of failures from 15 per cent to 4 per cent The daily dose of arsenic was 0 24 g. mapharside in 2000 c c of 5 per cent dextrose solution by intravenous drip for Bismuth sodium tartrate equivalent to 22 g bismuth each 8 hours daily day was injected intramuscularly for the 5 days The morning urine was tested every day for urobilinogen. Reactions were generally mild (fever, nausea, pain in the arm, mild headache), but their incidence was high and treatment had to be discontinued in 6 per cent of cases No fatalities occurred, but 3 with cerebral reactions recovered with no apparent sequelæ; 8 per cent were rejected as unsuited to this form of treatment, 421 of the 481 cases completed the full 5-day course of treatment, 310 with mapharside alone and 111 with mapharside and bismuth used concurrently. Results were satisfactory in those given mapharside alone and in 98 5 per cent of those receiving mapharside and bismuth

Massive Arsenotherapy during Pregnancy.—Rattners also treated 27 pregnant women with syphilis by the 5-day method, with arsenic and bismuth concurrently. Treatment was well tolerated by both mother and feetus during all the stages of pregnancy and whether the syphilis was primary, secondary, or latent. There were no severe reactions nor interference with pregnancy, 25 gave birth to normal full-term infants, 1 syphilitic infant was born of a mother apparently re-infected while the infant was still in utero, and 1 patient was lost from observation. In addition, 5 who had been treated for early syphilis by the massive-dose method later become pregnant and gave birth to normally developed sero-negative infants, although further antisyphilitic treatment was withheld deliberately from the mothers

Intensive arsenotherapy, while offering better immediate results than orthodox treatment, increases the incidence of toxic effects, and, according to J Marshall, has a fatality risk four times as great. He believes that the future treatment may be a compromise between the present standard scheme and the intensive methods and will probably last from 4 to 10 weeks. The arsenical will almost certainly be arsenoxide injected 3 times a week, bismuth being used concurrently [Probably penicilin, being non-toxic and more spirochæticidal, will replace, or be combined with, arsenotherapy—T. A.-D.] In the American Army, T. B. Turner and T. H. Sternberg¹o have employed such a scheme. 40 injections of arsenoxide twice weekly with additional injections of bismuth, during a total of 26 weeks. Results have been excellent, and from the standpoint of toxic reactions and practicability, the scheme seems definitely superior to the older orthodox treatment.

Mortality with Massive Arsenotherapy.—J. H. Stokes, H Beerman, and V S. Wammock<sup>11</sup> have reviewed the treatment of early and latent syphilis and progress during the past 35 years. The foreshortened intensive methods of arsenotherapy show a wide variety of technique. 5-day intravenous drip, 10-day multiple injection, 10-12 weeks of 2-3 injections weekly, and 26-week schedules. The mortality of the 5-day drip method is currently estimated at 1 in 200 or 1 in 300. Any schedule completed in 20 days or less is expected to have a mortality higher than 1 in 1000, and 10 to 12-week systems have a mortality of approximately 1 in 1500, while the mortality attending 20- and 26-week systems is not yet known. Mortality in the standard orthodox systems with arsphenamines has been estimated at 1 in 2800, but this figure drops materially with arsenoxide.

Latent Syphihs.—T. H Diseker, E G Clark, and J E. Moore<sup>12</sup> have reviewed the long-term results among 5826 patients with latent syphilis admitted to Johns Hopkins Hospital between 1914 and 1984, 926 having been observed for more than 5 years Relapses were no more frequent among sero-resistant patients than among those who obtained negative reactions in the first year.

The highest proportion of relapses occurred among patients receiving under 15 arsenical injections and a corresponding number of heavy metal injections Relapse was no more frequent among patients receiving 15 to 19 injections than among those with more treatment. The optimum amount of treatment to reduce relapse to a minimum is approximately 20 injections each of an arsenical and a heavy metal.

Interstitial Keratius Treated with Vitamin E.—S Stone<sup>13</sup> considers that vitamin E combined with vitamin B complex is a valuable adjunct in the treatment of interstitial keratius During 3 years he treated 10 cases of advanced interstitial keratius with vitamin E (wheat oil and wheat-germ oil

concentrate) All had previously received ample antisyphilitic therapy and 4 had artificial fever therapy without affecting the keratitis. Artificial fever alone had little effect on the absorption of corneal opacities, it is of value mainly in preventing relapses and in ameliorating acute symptoms. Vitamin E hastened absorption of superficial and deep corneal exudates, it helped to relieve photophobia and to reduce corneal vascularization. Administered for several months, it produced a gradual and continuous clearing of extensive opacities and corneal scarring, with a return to normal vision.

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#### TACHYCARDIA, PAROXYSMAL (See ARRHYTHMIA)

#### TESTICLES, SURGERY OF.

Hamilton Bailey, F R.C.S

Injury and Stram as a Cause of Testicular Disease.-

Dislocation of the Testicle—Due to a blow, a testicle occasionally becomes dislocated, usually into the inguinal canal. In P J Shammon's case the dislocated testicle became gangrenous Orchidectomy was performed

The disputed question as to whether an injury can cause a malignant tumour of the testis has been extensively reviewed by J. B. Gilbert.<sup>2</sup> His conclusions are that all evidence is against this assumption, and that claims for compensation have been settled on the basis of sympathy, and not science

"Can epididymo-orchitis result from a strain at work?" is a question which has proved a riddle in medico-legal circles The consensus of opinion has been that it is extremely doubtful, but difficult to disprove M. L. Amdur<sup>3</sup> is Medical Officer to a large industrial clinic in Buffalo, and he has collected data of fourteen In all the patient had non-specific epididymo-orchitis and alleged cases stated that the pain started while he was lifting or pushing a heavy object most instances M L Amdur ascertained that the bladder was full at the time of the alleged accident, and he suggests that retrograde mechanical propulsion of urine down the common ejaculatory ducts, whether infected or not, produces a sudden onset of epididymo-orchitis [Unfortunately, Amdur's series of cases does not appear to have been examined from the point of view of obtaining a prostatic smear in order to eliminate an infection of the seminal vesicles and prostate --H. B.]

R B Henline and W Yunck<sup>4</sup> consider that it is logical to assume that a severe strain or excessive physical exercise is sufficient aggravation of a pre-existing urinary or prostato-vesicular infection to aid in the development of epididymits. This is of considerable medico-legal importance

Non-specific epididymitis, by which is meant epididymitis that is not tuberculous and not of gonococcal origin, has proved to be common in service personnel during the war. E. G. Slesingers found there was frequently a history of strain, and he believes that back-flow of urine down the vas could, and did, occur. J. C. Ainsworth-Daviss divides the cases into two types—those secondary to genito-urinary infections, and those primary as far as the urinary and genital tracts are concerned. Those due to the colon bacillus occur mainly in individuals who are run-down. Boils, carbuncles, and tonsillitis are probably the primary source of the staphylococcal cases. Absolute rest in bed, with the testicles supported by strapping across the thighs, together with sulphathiazole (two tablets t d s for five days) usually results in resolution.

S M Laird records a case of bilateral meningococcal epididymitis occurring in an R A M C officer, aged 25 The meningococcus and the genococcus are

closely related members of the Neisserian group, and may, on occasions, produce identical clinical pictures

Maldescent.—A correspondent of the British Medical Journal<sup>5</sup> recommends that hormonic treatment of maldescended testis should consist of 500 rat units of chorionic gonadotrophine given intramuscularly twice a week until descent occurs, or three months' treatment has been given. If this is ineffective, operation should be advised

Hypophysial gonadotrophines provide the stimulus necessary for descent of the testes L J Wells's affirms that proof of this is afforded by pre-pubertally hypophysectomizing animals. This arrests testicular descent, which can be resumed by the injection of gonadotrophic hormones

T C Skinner<sup>10</sup> records a case of a corporal, aged 43, with an irreducible femoral hermia which contained an ectopic testis. Whether a testis ever spontaneously passes through the femoral ring has been questioned. This case proves that it can.

Malignant Disease.—Seminomata of the testicle occur at a later age than do teratomata (Fig. 43). The maximal age incidence of seminomata is the fourth

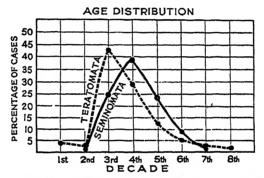


Fig 43—The age incidence of teratomata and seminomata of the testicle (After Nash and Leddy)

decade Approximately 14 per cent occur in maldescended testicles Seminomata also occur in elderly dogs. They are less malignant than similar human neoplasms, and are more frequent when the testicle is maldescended. L. A. Nash and E. T. Leddy<sup>11</sup> agree with Gordon-Taylor and Till's subdivision of seminomata into four clinical groups.—

- 1. The "average", slowly growing, insidious, painless type
- 2. The hurricane, where widespread secondaries occur sometimes in a matter of weeks.
- 3. The encapsulated, which occasionally persist for years with no apparent change.
- 4. The patient who appears with an abdominal mass above the umbilicus due to secondary deposits

They find no help in the diagnosis and treatment of seminomata from hormone estimations (Aschheim-Zondek test) in the case of the large series of seminomata under their care. The treatment they favour is orchidectomy with thorough deep X-ray therapy to follow. The latter is of primary importance in the management of these tumours, and in the case of seminomata has altered the prognosis from one of hopelessness to one of subdued optimism [Most seminomata are extremely radiosensitive, and all who have studied the subject

are in complete agreement with these authors. On the other hand, most teratomata are radioresistant, and the complete operation of dissection of the lumbar glands offers these patients most hope. One of my patients with a

teratoma of the testis and a secondary deposit in the lumbar glands is alive and well 8½ years after the operation—H B]

G G. Smith<sup>12</sup> is also of the opinion that the gonadotrophic tests have proved of little prognostic value in the diagnosis and treatment of cases of malignant testicle

A testicular tourniquet as an aid to testicular biopsy is described by N C Schlossmann <sup>13</sup> The tourniquet is quite simple, and its use is shown in Fig. 44 Having injected local anæsthetic, a small incision through the subcutaneous layers causes the testicular coverings to hermiate When the tunica albuginea is in view, a touch of the knife blade causes seminiferous elements to protrude These are spinned off for microscopic investigation.

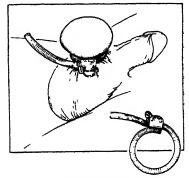


Fig 44 —Schlossmann's device for aiding testicular biopsy

snipped off for microscopic investigations. The entire incision is 1 cm in length, and that through the tunica less than 1 cm

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# THYROID GLAND. Sir Walter Langdon-Brown, M.D., D.Sc., F.R.C.P. Samuel Leonard Simpson, M.A., M.D., F.R.C.P.

Thouracil in Thyrotoxicosis.—In last year's Medical Annual we reviewed a paper by Astwood, and a confirmatory one by Himsworth, on the use of thiouracil and thiourea in thyrotoxicosis. Since that time several workers have confirmed the claims of Astwood as to its therapeutic value, and also, unfortunately, the toxic effects that occur in some patients. On the whole, clinicians prefer thiouracil to thiourea, the latter producing an unpleasant odour in the breath, and perhaps being more toxic.

An important discussion was held at the Royal Society of Medicine in June, 1944 Himsworth, in opening the discussion, recorded his experiences in a series of patients, some of whom had been under observation for many months. The initial treatment consisted of 2 tablets of 100 mg each, three to five times This was continued for some weeks until considerable improvement resulted-fall in pulse-rate and in basal metabolic rate, gain in weight, and amelioration of general features, eg, sweating and nervousness Improvement usually began in the second week of treatment Apart from basal metabolic rate determinations, the raising of a low blood-cholesterol to normal was a good As soon as good effects were established, 4 to 8 weeks, control indication Himsworth advised cutting the dosage of thiouracil drastically to avoid toxic symptoms, and found that most patients remained well on 100 mg or even 50 mg. of thiouracil daily Most patients were able to resume work after three months, and continued so for the period of observation, e.g., 1 year thalmos and enlargement of the thyroid were features that did not improve. Patients who had previously had iodine were found not to respond initially to thiouracil, but ultimately did so.

Himsworth stated that toxic symptoms are due both to idiosyncrasy and to large dosage. Initially, blood-counts must be done weekly, and if the total leucocytes or the polymorphonuclear cells are greatly depressed, treatment cannot be continued, as fatal agranulocytosis might develop. Rashes, fevers, malaise, and enlarged lymph-glands are other toxic manifestations.

Joll, in another opening paper, recorded successful results in 6 of 9 cases of primary thyrotoxicosis He was, however, sceptical as to the value of thiouracil in secondary thyrotoxicosis, and advocated strict control in its usage until greater knowledge was available Horace Evans, G Melton, Sharpey Schaefer, and S L Simpson tended to confirm Astwood and Himsworth Simpson pointed out that a disappearance of exophthalmos was not to be expected, since it did not often occur after thyroidectomy, as the exophthalmos was more related to secretion of thyrotrophic hormone than to thyroxine Lid retraction, as distinct from exophthalmos, did, however, tend to disappear after thiouracil as after thyroidectomy It was believed that thiouracil acted by preventing the synthesis of thyroxine, and as this was comparable to a physiological thyroidectomy, pituitary thyrotrophic hormone was secreted and produced hyperplasia of the thyroid acini Therefore, the thyroid gland might not decrease in size in spite of clinical improvement, and might even increase in some eases Himsworth, in replying, expressed the view that Joll's refractory cases were due to premedication with jodine, and he could not concur with Joll that secondary thyrotoxicosis failed to respond to thiouracil. The general consensus of opinion appeared to favour the use of thiouracil in thyrotoxicosis, providing that there were no early adverse effects on the leucocytes, and no pressure symptoms from the goitre

Several papers have also appeared in America since Astwood's initial report Thus, R W Rawson and colleagues2 reported favourable results and contributed to the theory of action of thiouracil They observed, as did Himsworth. that "patients who had received iodine previous to thiouracil treatment made much slower response to the drug, and their thyroid glands in section showed only minimal to moderate hypertrophy, accompanied by some involution" They concluded that "any previously stored hormone in the thyroid continues to be excreted", and symptoms of thyrotoxicosis therefore continue glands recovered from patients with Graves' disease who had been prepared with thiouracil contained only one-fourth of the quantity of iodine contained in the glands of thyrotoxic patients not receiving thiouracil. This is in keeping with the observations of S Hertz, A Roberts, and W T Salter<sup>3</sup> that normally the thyroid gland of thyrotoxic patients shows a great avidity for radio-active odine, but not if the patients were previously treated with thiouracil in the former case, they excrete only 18 per cent of the administered radioactive iodine, whereas in the latter case they excrete 100 per cent Rawson concluded that the action of thiouracil is to block the normal iodination of protein concerned in the production of active thyroid hormone E W Dempsey4 demonstrated by in vitro technique that thiouracil will inhibit peroxidase activity in the thyroid, and suggested that diminished peroxidase activity would interfere with the conversion of duodotyrosine to thyroxine R. H Williams and G W Bissell<sup>5</sup> treated 9 unselected cases of thyrotoxicosis with thiouracil, and in each case "toxic manifestations disappeared, and the basal metabolic rate returned to normal range" Blood-iodine studies. conducted on 4 patients, showed in each case a fall of the protein-bound iodine to a low normal or subnormal level They found that patients with adenomatous goitres respond in the same way as those with primary thyrotoxicosis

E C Bartels<sup>6</sup> found thiouracil of value in 11 cases of severe thyrotoxicosis as a more effective pre-operative treatment than iodine, when the surgical

risk was great Some of the natients could not reach a satisfactory condition with iodine before thiouracil was tried. One disadvantage of thiouracil is that the thyroid gland becomes very hyperplastic and bleeds easily, causing surgical This is ameliorated by giving iodine at the same time, the iodine producing involution If iodine is given beforehand, however, the patient is refractory to thiouracil for some time. The author considers thiouracil of great value in cases that are severe surgical risks, and advises its continuation until the maximum effect is obtained Several papers, both in America and in this country, have recorded toxic effects from thiouracil, e.g., fever, dermatitis, arthralgia, jaundice, leucopenia, thrombopenia, generalized lymphadenonathy, and splenomegaly, and in one case fatal agranulocytosis. It is obvious that every care is needed in the use of a potent and useful drug Goldsmith and colleagues, have found that liver extract injections prevent agranulocytosis in male rats receiving thiouracil, and this may prove of similar value in patients sensitive to thiouracil

E. B Astwoods has now made a second report on the use of thiouracil in thyrotoxicosis, and has followed a series of cases over a period of approximately two years His initial dose of thiouracil was 600 mg daily, and some patients appeared to respond to 200 mg daily. Divided dosage during the day was more effective than a single large dose. As soon as clinical improvement occurred, and the basal metabolism fell to normal or near normal level, the dose of thiouracil was drastically reduced to 100 mg or even 50 mg daily After some six months' successful therapy in 18 cases, thiouracil treatment was stopped entirely 9 cases relapsed within a few weeks, but the other 9 remained well without any therapy during the period of observation, 5 to 8 months This is certainly encouraging Toxic effects of thiouracil were observed in 10 per cent of the patients treated. As to changes in the size of the goitre under treatment, Astwood found that the gland usually became softer, and this gave a clinical impression of diminution in size, although in several instances "an unquestionable enlargement occurred in the first few months of treatment" Increased vascularity of the gland was indicated by an increased bruit on auscultation. Although iodine given before treatment resulted in a delayed response to thiouracil, iodine given during the course of thiouracil therapy "was followed by the same type of response as is observed when iodine is given in cases of untreated Graves' disease" can only be explained theoretically on the grounds that the dose of thiouracil did not completely inhibit the synthesis of thyroxine, but practically it suggests that jodine can be used as an adjuvant to thiouracil treatment, and, in those cases that come to operation, iodine renders the gland less vascular than when thiouracil alone is used Astwood was more hopeful about ocular symptoms than previously, noting a decrease in exophthalmos in most cases, as well as a decrease in the degree of lid retraction. Only one patient showed an increase in exophthalmos in spite of improvement in other directions Of 8 cases of toxic nodular goitre, 5 came to thyroidectomy This type of goitre does respond eventually to thiouracil, but the response is a slow, delayed one, probably due to the fact that such glands have a big store of iodine found it difficult to produce a thiouracil effect in patients with normal thyroid glands, and does not consider that it has a useful place in the suggested physiological thyroidectomy by thiouracil for cardiac disease.

Endemic Gotre in England.—Recent observations by the Medical Research Council<sup>9</sup> indicate that the incidence of endemic gotte in certain geographical belts in this country has not appreciably diminished. The incidence of enlarged thyroid in girls is in some areas as high as 25 per cent, e.g., Somerset, Oxfordshire, Northumberland, and Durham. There is ample evidence that a

deficiency of iodine content in the food and water is a fundamental factor, although physiological periodic needs and individual or familial susceptibility are contributory causes.

Fundamental improvement in water-supply should be undertaken, but is a long process Food education and distribution, e.g., of fish, which has a high indine content, are recommended, but in themselves cannot be depended upon.

It is noted that large-scale prophylaxis in various parts of the world, including Switzerland, Poland, and America, has already proved the efficacy of the administration of iodized salt, and the Goitre Sub-committee of the Medical Research Council "strongly urge the adoption of a national policy of adding a trace of iodine to all common salt consumed in the country—in the proportion of one part of potassium iodide to one hundred thousand parts of common salt."

Determination of Basal Metabolism on Out-patients.—J D. Robertson¹º has collected evidence to prove that basal metabolic estimations may be carried out on ambulatory patients, who arrive at hospital by normal transport, providing that 30 minutes' repose is allowed before the test. For special accuracy, it is advisable that the test be repeated on another day, and the lower of the two readings accepted. The Benedict-Roth apparatus was used, but the principles enunciated hold good for other reliable apparatus.

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#### THYROID SURGERY.

Lambert Rogers, M Sc., F R.CS

Thyrotoxicosis.—To what extent the surgery of thyrotoxicosis will be modified by the use of thiourea, thiouracil, and their allies is not yet apparent It is true to say, however, that the enthusiasm with which these drugs were received has, as is usual in the course of time with most things new in medicine. given place to a more temperate appreciation and recognition of their limitations. These drugs are by no means harmless, as was at first claimed by some writers, and agranulocytosis and other toxic manifestations1 have been reported following their use. It is probable that, like radiotherapy, they may quieten the acute disease without abolishing its effects on the myocardium, so that auricular fibrillation may yet follow long after the clinical features of thyrotoxicosis have ceased to be apparent Subtotal thuroidectomy remains the safest treatment of most cases of well-established thyrotoxicosis, not only because it produces a rapid alleviation of signs and symptoms of the disease, but also because it protects the patient from its late effects on the myocardium

Surgery: Protection of the Recurrent Laryngeal Nerves.—F. H. Lahey,<sup>2</sup> of Boston, who in 1938 recommended routine exposure of the recurrent laryngeal nerves in goitre operations, writes again advocating this. It is a practice, however, which few surgeons in this country follow, contenting themselves rather with leaving a strip of thyroid tissue to protect the nerve and avoiding its dissection so as not to implicate it in scar tissue. Lahey's comment on thus regarding the nerves as 'untouchables' is that the practice is comparable with performing total hysterectomy and trying to avoid the ureters without actually isolating them. Faults will be apparent in this analogy, however. In his paper he illustrates the variations in the position and relationship of the nerve (Figs. 45, 46). In intrathoracic or adenomatous goitres it tends to be pushed towards and flattened against the trachea. If the nerve is not in its usual place, crossing either in front or behind the inferior thyroid artery or passing between its terminal branches (Lambert

Rogers<sup>3</sup>), it should be sought at the upper pole of the gland, as it sometimes passes directly from the vagus to the larynx Before entering the larynx the nerve-trunk may divide into two divisions which constitute its abductor and adductor fibres

Lahey finds that post-operative suture of injured or cut recurrent laryngeal nerves, even a few months after thyroidectomy, is unsatisfactory The best approach to such complications, therefore, he claims is prevention, not restoration.

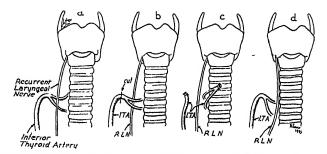


Fig. 45—a, Nerve passing over the inferior thyroid artery b, Nerve passing under the inferior thyroid artery c, Method of dividing the inferior thyroid artery to follow nerve up to its point of entrance into the larynx d, Position of nerve when it is pushed against the trachea by an intrathoracic gotte or by an adenoma

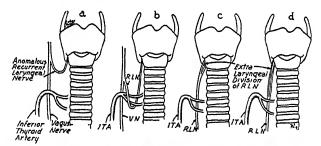


Fig. 46.—a, Anomalous nerve passing straight from the vagus nerve into the larynx b, Anomalous nerve passing down under the inferior thyroid artery and then up into the larynx. c, Extralaryngeal division of the nerve into abductor and adductor fibres d, Same as c with lower separation

(Figs 45, 46 reproduced from 'Surgery, Gynecology and Obstetrics')

Extreme Exophthalmos.—This was previously discussed in the Medical Annual, 1940 (p 457) and that for 1942 (p 311) In paradoxical, severe progressive or malignant exophthalmos (exophthalmic ophthalmoplegia) there is an increase in volume of the extra-ocular muscles which it has been suggested is brought about by the thyrotropic pituitary hormone (N. M. Harry<sup>4</sup>). Naffziger's operation of orbital decompression by trans-frontal removal of the orbital roof produces gratifying results in these cases. The swollen extra-ocular muscles are accommodated by the increased space thus provided the reviewer has performed this operation in several cases in each of which the swollen pallid condition of these muscles at the time of operation has been noted

An instructive case has recently been reported from Australia by R Flynn <sup>5</sup> The patient was a woman, aged 24, with extreme proptosis, ophthalmoplegia,

and diplopia Following a course of iodine, subtotal thyroidectomy was performed and afterwards the eye signs (as has previously been noted in some cases) became even more pronounced, and during the next few months continued to progress. Six months after her operation the condition was extreme (Fig. 47), and a further operation was performed, the whole of the remaining thyroid tissue being removed, after which she was given thyroid extract. Following the complete thyroidectomy striking improvement took place and the condition of her eyes has returned to normal (Fig. 48). [What to do in these cases of extreme proptosis is always a problem. An orbital decompression operation performed in the presence of thyrotoxicosis may be fatal from post-operative thyroidism; subtotal thyroidectomy may aggravate the proptosis to the extent of dislocating the eyeball or producing corneal ulceration. The good result which followed complete extirpation in the case referred to would suggest that total thyroidectomy might well be tried

followed by Naffziger's operation if the proptosis continues to progress -- L C R.1





Fig 47 —Patient before operation, March, 1989. Fig 48 —Patient in May, 1942

(Figs 47, 48 reproduced from 'The Medical Journal of Australia')

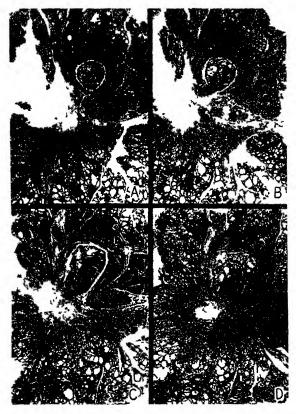
Localized Pre-tibial Myxcedema in Thyrotoxicosis.—Reference has been made to the indictment of the thyrotropic pituitary hormone as the cause of paradoxical, severe and progressive, or malignant exophthalmos. This hormone has also been held responsible for the curious condition of pre-tibial myxcedema which may also be described as a paradoxical manifestation of thyrotoxicosis. In 1935 Sir Thomas Dunhill<sup>6</sup> wrote of this occasional manifestation "It is interesting rather than serious". The majority of reported cases have occurred in Europeans, but of 78 cases which W. R. Trotter and K. C. Eden' reviewed, 2 were in negroes and 1 in a Chinese. During the past year J. G. Parekh<sup>6</sup> has reported an example in an Indian woman, aged 30 Mention was made of pre-tibial myxcedema in last year's Medical Annual. (p. 318)

Riedel's Disease and Perithyroiditis.—J L De Courcy, of Cincinnati, remarking that the surgeon seldom sees Riedel's thyroiditis until the acute phase has subsided, discusses the pathogenesis of the condition and its association with perithyroiditis. He suggests that beginning as a perithyroiditis the inflammatory process spreads from without inwards, produces the well-known adhesion between the pre-thyroid muscles and the capsule of the thyroid gland, and in doing so brings about an occlusion of blood-vessels.

# PLATE XLIV

#### CANCER OF THE THYROID

(E Gorrsen)



Photomicrographs ( $\times$  12) of four representative sections at different levels in a small scirrhous carcinoma occurring in exophthalmic gottre. Note in the centre of the lesion a minute adenoma, the site of the primary papillary indenocarcinoma which had perforated the capsule of the adenoma

- A Superficial section of the encapsulated adenoma and the surrounding scirrhous
- A Superficial section of the encapsulated distributed and the capsule by the papillary neoplasm which is extending beyond the confines of the idenoma.

  C, The section at this level shows a large defect in the capsule and the hyalinized fibrosis opposing the extension of the malignant growth

  D Section showing the wide area of surrhous carcinoma and in its centre the papillary primary neoplism still confined to the adenoma

Reproduced from the 'Annals of Surgery'

He believes that Riedel's disease is thus due to vascular changes in the thyroid secondary to perithyroiditis

Hashmoto's Disease.—To-day but little doubt can remain that Riedel's thyroiditis (Eisenharte struma), and Hashimoto's disease (struma lymphomatosa) are separate entities. Reasons for so regarding them were given in the Medical Annual, 1939 (p. 503). C. A. Joll's authoritative paper which was reviewed in the Medical Annual, 1941 (p. 374), appeared to dispel all doubt. The reason for the two conditions being confused was Ewing's contention (1922) that they were stages in the one disease. This opinion of the well-known pathologist could not be lightly disregarded.

In a recent paper on Hashimoto's disease B McSwain and S W Moore, 11 of New York, refer to the controversy and support the view that the diseases are in no wise related They record 15 cases of struma lymphomatosa treated at the New York Hospital between the years 1932 and 1942 All were women, the youngest aged 26, the oldest aged 60 In most cases the thyroid was moderately enlarged, in none was it fixed. They describe the typical case of struma lymphomatosa as follows A woman, aged 40 to 45, has a goitre of long standing which has grown slowly, she complains of weakness, fatiguability, slight nervousness, and some pressure symptoms She is moderately obese, the thyroid is moderately enlarged, fairly uniform in consistence, and The basal metabolic rate is slightly below normal and a bloodfilm shows a slight relative lymphocytosis. After operation the majority of patients develop hypothyroidism, and radiotherapy therefore appears to be the treatment of choice

Malignant Disease.—It is commonly stated that a high percentage (even 90 or over) of cases of carcinoma of the thyroid are adenomatous in origin a recent paper Emil Goetsch,12 of Brooklyn, has produced evidence which suggests that the incidence of malignant adenoma may be even higher questions whether carcinoma in reality ever occurs as a primary lesion in the diffuse hyperplastic goitre of primary Graves' disease Suspecting that the carcinoma occurring in exophthalmic goitre may originate in a ininute fœtal adenoma, Goetsch examined the examples from his clinic A minute carcinomatous lesion, definite, or strongly suspected, was found in each of 9 instances Definite adenomas were found in three cases He believes that primary carcinoma rarely, if ever, occurs in the hyperplastic gland, and when it is so found it has probably arisen in a minute adenoma which has subsequently been obscured by the overgrowth of the lesion It is a common observation, as he points out, that the coexistence of these adenomata and the hyperplastic gland of exophthalmic goitre is strikingly rare This fact doubtless accounts for the extremely low incidence of carcinoma in exophthalmic goitre When it does so occur it is probably an example of malignant degeneration of a pre-existing and possibly minute adenoma (Plate XLIV)

Rellenges — Lancet, 1944, 2, 13, Surg Gynec Obstet 1944, 78, 239, J Anat. 1929, 64, 50, Med J Aust 1941, 1, 412, Ind. 1944, 2, 344, But Med J 1935, 2, 1034, Quart J Med 1942, 11, 229, Indian med Gaz 1944, 1, 20, J Amer med Ass 1943, 123, 307, Note plastic Disease, Philadelphia, 1922, Surg Gynec Obstet 1943, 76, 562, 12 Ann Surg 1943, 118, 843

## TONGUE, THE. Sir Henry Tidy, M.D., FRCP

Douglas Anderson¹ (Sydney, Australia) contributes a useful review of the interpretation of transient changes in the tongue, a subject to which little attention is paid nowadays. The older physicians interpreted what they saw in the tongue in the most elementary kind of way, but with the most dogmatic conclusions. A mysterious sympathy was supposed to exist between the tongue and the alimentary canal which showed itself in such beliefs as that the tongue is "the mirror of the intestines" and "raw red tongue, raw red gut". A

modern generation has found that most of these statements are unfounded Nowadays nobody is certain as to what is the exact meaning, for example, of the coated tongue, and we are apt to leave it out of our calculations. The coated tongue is due to abnormal proliferation of the papillary epithelium and its retention on the surface. Old physicians attributed this to pyrexia, and before the day when the thermometer was in daily use, used it as a guide to rise of temperature Later it was affirmed that a coated tongue is frequently found in healthy normal persons, specially in smokers and specially in the morning It was also considered to be specially associated with constipation It is important to observe that the latter statement is untrue, but it has been and still is largely used by the proprietors of certain aperient medicines constipation may be compatible with a perfectly clean bright tongue Consistent and considerable dryness of the tongue implies, as a rule, failure of the salivary secretion, and readily results from dehydration of the body But dryness of the mouth does not necessarily connote suppression of the saliva, and may be caused through breathing through the mouth as occurs temporarily in coryza The geographical tongue, also known as wandering rash of the tongue, is usually a sign of impaired health 
It may occur under many circumstances, but it is never seen in those who are robust.

REFERENCE - Med J Aust. 1944, 1, 809

#### TORTICOLLIS, CONGENITAL.

Sir John Fraser, M Ch, F R C S Ed.

The clinical features associated with congenital torticollis are well known, but there is considerable dubiety regarding the explanation of the changes which arise in the lower end of the sternomastoid muscle, and, indeed, it is correct to say that uncertainty remains in spite of much investigation and experiment.

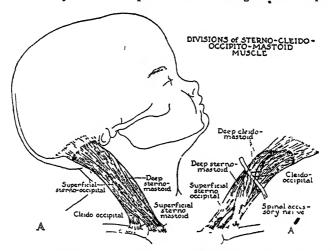


Fig 49—A, external, and A', internal, view of right sternocleidomastoid muscle showing chief muscle bellies and their relation to the spinal accessory nerve. (Figs 49-51 reproduced from the 'Journal of the American Medical Association')

The muscle changes are initiated by the development of the 'muscle tumour', the spindle-shaped swelling, somewhat tender to touch, which arises in the lower end of the muscle immediately above its origin from the sterno-clavicular junction. Microscopical examination of the affected tissue shows

constant and characteristic changes—degeneration of muscle fibres, the formation of young connective tissue in the inter-bundle spaces, the presence of fibrocytes—it is significant that no evidence of hæmorrhage, recent or old-standing, has been reported—These changes are preliminary to a stage in which the muscle is completely replaced by fibrous tissue, and, while in most

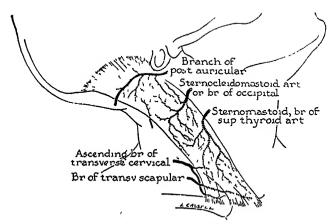


Fig 50 -Chief arterial supply of sternocleidomastoid muscle

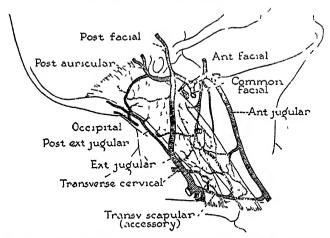


Fig 51.—Chief venous drainage of sternocleidomastoid muscle, showing large number of venous anastomoses within and without the muscle tissue

cases this feature remains localized to the area previously occupied by the muscle tumour, in many instances it spreads so that ultimately the whole extent of the muscle is involved

Many explanations of the changes have been advanced, but, as there are occasions when multiplicity of suggestions implies individual uncertainty, such would appear to be the position in respect of our knowledge regarding

the manner in which congenital torticollis occurs F A Chandler and A Altenberg1 have brought the position under review in a recent article After enunciating the many theories of origin which at one time or another have found support, they pay particular attention to the vascular explanationsarterial occlusion (ischæmia) and venous occlusion. As a basis of comment they carried out a number of dissections of the sternomastoid area with a view to gaining first-hand information on the development and the vascular arrangements of the muscle (Figs 49-51) The authors' investigations lead them to question the influence of the vascular arrangements in respect of the origin of congenital torticollis, they reject the venous occlusion theory in its entirety They believe that intra-uterine malposition is the essential primary error, and they contend that secondary to this the lower end of the muscle becomes atrophied, shortened, and in some degree ischæmic. In the presence of such local changes a degree of strain, which in ordinary circumstances would have no prejudicial effect, damages the weakened area, so that degenerative and necrotic changes result

Interesting as these observations are, it cannot be said that they offer a full explanation of the origin of the error. The views are very similar to those advanced by Sippel twenty-five years ago, and in the opinion of many pediatricians they do not supply a full and satisfying explanation

The authors urge the advantage of early surgical treatment in cases showing muscle shortening and obvious deformity. There is no exact definition of the age period, but the case-histories indicate that operation is carried out on infants a few weeks old, the principle underlying it being excision of the muscle tumour.

REFERENCE -1 J Amer med Ass 1944, 125, 476

#### TOXICOLOGY

R St A Heathcote, DM., FRCP

Methyl Bromide.—Methyl bromide, CH3Br, is a colourless liquid with a slight ethereal, somewhat musty odour and boils at 45° C Owing to its chemical and physical properties, it has been used as a refrigerant and in hand fireextinguishers In chemical industry it is employed in the manufacture of phenazone and of some of the synthetic dyes More recently, it has been found to be a most useful insecticide, being effective against them in all stages of development It leaves no residual taste or smell in articles treated with it. It is easy to use, as it is put up under pressure in the liquid form in steel containers A hose-pipe is connected to the latter and, on releasing the pressure, the gas is forced into any closed chamber containing objects to be furnigated There is no risk of fire or of explosion when the gas is mixed with air. It has a high power of penetration and is cheap. It has proved effective against bed-bugs and lice, though D D T (2 2-bis-(p-chlorphenyl)-1 1 1-trichlorethane) may perhaps be found more serviceable against the latter The present writer has been informed that it has been suggested for use against vermin, but he has no knowledge that it has, in fact, been so employed

Methyl bromide is unquestionably a somewhat poisonous substance and care must be taken to ensure that men engaged in handling it are not exposed to the risk of inhaling the gas. Any good activated charcoal gas mask will serve, and should be employed if there should be any risk (no doubt the Service pattern would be perfectly effective). Again, care should be taken that the liquid is not spilt and that any clothing which may become impregnated with it is removed for decontamination.

Experimentally, methyl bromide has been shown to be more poisonous to animals than methyl chloride or ethyl bromide or chloride, whether the exposure to which they are subjected is to a high concentration of the gas for a short, or

to a low concentration for a long, period (Sayers et al 1) Irish and his colleagues2 found that rabbits and rats could withstand a relatively high concentration for a brief period, but that, if that period were exceeded, they died, either quickly from pulmonary cedema or after a few days from bronchopneumonia Further, they showed that exposure, either on one or, more regularly, on several occasions, caused an increase in the motor excitability of the animals, evidenced by muscular twitchings or convulsions, followed by paralysis If the exposure were terminated on the appearance of these motor effects, the animals might make a complete recovery Other organs, especially the kidney, were found to have suffered injury as well For single exposures, the fatal period ranged from 6 minutes with 50 mg /litre to about 24 hours with 0 85 mg / With repeated exposures of 8 hours a day on five days of the week, rabbits proved the most susceptible of the various species used, 013 mg/litre causing paralysis in many, and lung damage in some On the other hand, rats and guinea-pigs withstood exposure to 0.25 mg./litre, repeated in this manner for 6 months, with no apparent ill effects

In cases arising in man, it is scarcely ever possible to determine with any degree of accuracy the concentration of gas to which the victim has been exposed. Fatalities have been reported from time to time, chiefly on the Continent. They must be rare in this country as no death from methyl bromide poisoning could be found in the Registrar-General's returns from 1921 to 1939. This, of course, does not exclude non-fatal cases of poisoning. Altogether, v. Oettingen³ collected some 42 cases reported up to 1937, of which 12 died and 23 recovered, while the result in 7 was unknown. Since then, at least one further death has occurred (Miller³)

In general, the symptoms and signs observed in human poisoning resemble fairly closely those occurring in animals. Pulmonary cedema, bronchopneumonia, and septic bronchitis have been found in cases of exposure, even for a short time only, to concentrations which probably were fairly high. Thus, in Friemann's case<sup>5</sup> the exposure seems to have been for not longer than about two to three hours, and death from pulmonary conditions occurred about 60 hours later. For an exposure of such a duration, the fatal concentration (by interpolation in the tables given by Irish et al 2), would have been, for rats and rabbits, about 25 and 15 mg/litre, respectively. In Miller's case, 4 the concentration was probably of the order of 32 mg/litre. Here, however, the duration of exposure was relatively long, about 7 hours, and death occurred, again from pulmonary damage, about 80 hours after termination of the exposure.

In non-fatal poisoning in man, the symptoms arise almost invariably from the central nervous system-headache, vertigo, paresis or paralysis, disturbances of vision (nystagmus commonly), and, in more severe cases, delirium, con-Watrous found that in about one-third of a number vulsions, or even coma of persons exposed to a supposedly safe concentration of 0 13 mg/litre, symptoms of poisoning could be detected Such a strength, however, caused severe poisoning in rabbits on repeated exposure 2 Three cases have been recently reported by DeJong' in which, together with a variety of symptoms and signs arising from the nervous system, loss of weight was prominent, as much as 17 lb. There was no evidence as to the concentration of the gas inhaled, and owing to its very slight smell the presence of small amounts would probably not be observed In some cases it has been observed that there may be a delay in the onset of toxic effects (Floret, 8 Steigers). If the central nervous system effects are well marked, recovery from poisoning may be very slow, a matter of months (De Jong?) or even years (Opperman, 10 Friemann 5).

While a more extended use of methyl bromide against insects, and perhaps vermin, will undoubtedly increase the possibility of poisoning, the risk should

not be great, given the exercise of sufficient care in its handling. In severe cases, with grave pulmonary damage, the chances of recovery are evidently low and it does not seem that much can be done for the victims. Atropine and continuous oxygen administration would probably give the best chance, while, if the lungs became infected, sulphonamides, or better, penicillin if available, might be tried. In the less severe cases, recovery on symptomatic treatment alone will probably be complete, though perhaps slow. Where possible, a change in employment to avoid further risk of exposure would be advisable

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TRACHEOTOMY: COMPLICATIONS. F W Watkyn-Thomas, F R C S
Tension Pneumothorax and Mediastmal Emphysema after Tracheotomy.—
The condition was first described by F H Campneys in 1884, in a series of cases reported from the Great Ormond Street Children's Hospital Since then there has been little reference to it in the English literature.

A H. Neffson<sup>1</sup> found that in 126 cases of tracheotomy for acute non-diphtheritic obstruction there were 17 cases of pneumothorax, all in patients between six months and four years of age

Neffson found also that while the relative frequency of tracheotomy has increased at his hospital (4.8 per cent during the 1931-35 period to 19.4 per cent for 1936-40) the incidence of pneumothorax fell from 25 per cent to 8 per cent. In 8 cases the pneumothorax was unilateral, 2 of these patients died. In 9 cases where it was bilateral 8 died.

In 30 patients there was mediastinal emphysema, in 5 of these mediastinitis and empyema were contributory causes of death. Subcutaneous emphysema was common.

Pneumothorax and emphysema after tracheotomy are probably due to increased negative pressure in the thorax caused by the respiratory obstruction Air is sucked through the wound along the cervical fascia into the mediastinum Thence the air advances: (1) Laterally—mediastinal blebs rupture into the pleural cavity, producing pneumothorax, (2) Upwards along the deep layers around the trachea, breaking into the subcutaneous tissues of the neck, (8) Downwards through the diaphragmatic openings into the retroperitoneal This view of the mode of production is supported by the fact that tracheotomy was done in the first twenty-four hours in 10 of the 17 cases, and that 8 of the patients died It is fair to assume that in these cases the obstruction, with resulting increased negative pressure, was most severe. Further, in 98 cases where a tube was passed before opening the trachea there were 11 cases of pneumothorax with 6 deaths, while of 38 where the tracheotomy was done without preliminary intubation there were 6 cases of pneumothorax with Although there is little difference in the mortality when pneumothorax occurs, the incidence of pneumothorax seems markedly less when the obstruction is relieved by intubation before tracheotomy. It should be noted that in 2 cases ballooning of the pleura without lung tissue into the wound was seen during the operation

Neffson thinks that, in order to avoid these complications, anatomical dissection and wide spreading of the fascia, especially the pretracheal fascia, should be avoided. The pretracheal fascia and trachea should be incised at the same time, from below upwards to avoid nicking the pleura, and gauze should be packed firmly around the tracheotomy wound to shut off the air entry

The signs of pneumothorax are · (1) Dyspnœa and diminution of the volume and force of the blast from the tube, although the airway is clear (2) Diminished excursion of the affected side, with displacement of heart to the opposite side. (3) Diminished voice- and breath-sounds Mediastinal emphysema is shown by crepitation at each heart-beat. In severe cases there is dyspnœa and cyanosis, with congestion of the neck veins Radiographs are advised, as soon as possible and as often as necessary. In severe cases immediate decompression with minimal manipulation is the best treatment.

[The best safeguard against the condition would be to do the tracheotomy before respiratory distress is extreme. If the patient is not seen until there is severe obstruction, a small bronchoscope or, failing that, a stiff intratracheal anæsthetic tube should be passed and kept in situ until the trachea has been opened. The advice not to separate the pretracheal fascia before incising the trachea might make the operation much more difficult for the inexperienced surgeon; even surgeons of considerable experience have been known to insert the tube into the fascial space and not into the trachea.—F W W-T]

REFERENCE — Arch Otolaryngol, Chicago, 1943, 37, 28, The 1948 Year Book of Eye, Ear, Nose and Throat, 462

#### TRICHOMONAS VAGINALIS.

T Anwyl-Davies, MD, FRCP.

It is a moot point whether the trichomonads per se have the power to penetrate the vaginal wall, possibly they need the assistance of a streptococcus or other organism to produce the necessary conditions Although infection in the male has been reported, Trichomonas vaginitis has not yet been proved to be a venereal disease Infection with the fungus Moniha albicans will produce signs and symptoms similar to those seen in trichomonad infestation Penicillin and the sulphonamides have no effect in the treatment of Trichomonas vaginitis. The pentavalent arsenicals (devegan, stovarsol, acetarsol) have been used in the form of vaginal suppositories W N Mascall<sup>1</sup> has also used a silver picrate preparation, picragol, in powder form for insufflation into the vagina, and a douche of 21 per cent negatol followed by careful painting of the cervical canal and vagina, particular attention being paid to the posterior fornix, with 100 per cent negatol by means of a cotton-wool applicator This was carried out once a week and in the interim a 10 per cent negatol pessary was inserted each night. As the rectum is a possible source of auto-infection, especially during the menstrual period, Mascall instructed patients to insert a 20 per cent negatol suppository each evening during the period The majority of cases will clear up with one or other of these treatments, but in refractory cases Mascall advises the following treatment painting the vulva with 100 per cent negatol twice weekly, douching each morning with sat sodii bicarb, and inserting a stovarsol tablet every evening except on the days of the painting The patient is also instructed that when the heavy menstrual loss has ceased, she should insert a tablet each evening into the vagina for the remainder of the menstrual period

REFERENCE - Med Pr 1944, 211, 390

#### TROPICAL EOSINOPHILIA.

Sir Philip Manson-Bahr, C.M.G., D.SO, M.D, F.R C.P

The exact role played by the eosinophil cell in immunity response has not yet been satisfactorily determined. It is well known that an increase of the cells is evoked by a great variety of infections, of which helminthic parasitization affords a classical example, and even here there are considerable variations in the degree provoked by different species of worms. The eosinophil response is particularly intense during the migrations of ascarid larvæ through

the lungs and in the ascaris pneumonia thus evoked, as described by Koino in Japan Massive eosinophilia accompanies the penetration stage by larval bilharzia worms, especially in B. manson and B japonica, also in trichiniasis and to a lesser extent in filariasis, especially in Loa loa infections in West Africa It is known, too, that a variety of toxic agents, or even neoplasms, may give rise to local aggregations of these cells. Eosinophilia usually is associated with that enigmatical disease—periarteritis nodosa Asthma and other lung affections, especially pulmonary coccidioidomycosis, as described in California Familial and hereditary eosinophilia by J F Kessel, also evoke eosmophilia has been described by A Hurst For a long time massive eosinophilia, in excess of any noted in parasitic diseases, with leucocytosis, has been recorded in individuals from the tropics presenting no obvious clinical manifestations, and now, on what seem to be tenable grounds, a new disease, 'tropical eosinophilia', has to be reckoned with Massive eosinophilia in Tongking was considered a distinct clinical entity by J Saint Etienne<sup>1</sup> in 1938, but the complete clinical syndrome was first defined by C Frimodt-Moller and R M Barton<sup>2</sup> (1940) in the Union Mission Tuberculosis Sanatorium, Arogyaram, Indiathat is, eosinophilia associated with X-ray appearances in the lungs, which they assert differ from those of Löffler's syndrome (see p 334) in that they are not transient and have no apparent connexion with tuberculosis, syphilis, or cardiac disease They believe that the condition is allergic in origin. Out of 175 patients, no less than 106 had 5000 eosinophils per c mm of blood on admission to hospital in some even the relative count was as high as 90 per The X-ray appearances were characterized by evenly distributed, but extensive, mottling The shadows averaged about 2 mm., there was usually increased striation, and in general appearance they somewhat resembled miliary tuberculosis or silicosis, but in none were the X-ray appearances typical of tuberculosis The symptoms were not asthmatic exactly, but consisted of fever, cough with sputum, and loss of weight, sometimes even, it was said, hæmoptysis Prognosis is good

R Freud and S Samuelson<sup>3</sup> (1940), from Palestine, classified the same clinical state as Loffler's syndrome, which they define as signs of pulmonary disease with X-ray shadows, but with eosinophilia in the peripheral blood. Importance is attached to the transient nature of the disease The authors state that 105 cases have been reported and describe one in their own practice Allergy, they are agreed, does play a part in pathogenesis

Engel, in China, and Koino, in Japan, ascribed it to the blossoming of the privet, but this has not been observed elsewhere. In some respects it resembles coccidiodomycosis in California, which is also connected with eosinophilia

R. Treu<sup>4</sup> (1943), under the title of pseudo-tuberculosis of the lungs, has treated two cases of "eosinophile lung" in Europeans The symptoms presented were on the whole identical, with cough, tubercle-free sputum, pyrexia, and loss of weight. X rays showed the same picture as already described The blood sedimentation rate was increased The eosinophilia (82 per cent) was immediately reduced after injections of acetylarsan 1 to 3 c c up to a total of 36 c c, and the sedimentation rate became normal

A T W Simeons<sup>5</sup> (1943) claims to have seen 35 cases in private practice in Bombay in 9 years. Here the outstanding signs are febrile intermittent bronchitis with high eosinophil leucocytosis. He remarks upon the singular character of these cells, which are highly lobated, and thinks they are pathognomonic of this disease. In view of this he prefers the term "benign eosinophile leukæmia." Treatment is specific by the arsenical marpharside, injected in 10 per cent calcium gluconate bi-weekly. Usually 4-6 injections are necessary to bring the leucocyte count to normal, so much so that relapses do not

result In Bombay it appears that some practitioners have in the past treated asthma with neoarsphenamine injections with success

That tropical cosmophilia is by no means restricted to the warm climates is shown in the paper by M H Bass<sup>6</sup> (1941), who has reported 3 cases in children in America, of which the first was observed in 1931. This was a girl of six who eventually died of bronchopneumonia. The second was a boy of eight who exhibited general lymphadenopathy and persistent leucocytosis between 24,000 and 45,000 with mature cosmophils between 33 and 73 per cent. In radiographs of the lungs the same miliary infiltration occurred, but after an interval of three years they vanished, but the cosmophilia gradually decreased during the course of seven years. In the third case—a 6½-years-old negro—there was pyrexia, palpable spleen, and general lymphadenopathy

R J Weingarten (1943), who also believes he has discovered a new disease. has seen 81 patients with this syndrome since 1934 in India. The illness commences in rather an ill-defined manner with lassitude, anorexia, slight evening pyrexia, and loss of weight After some days paroxysmal dry cough and expiratory dyspncea, which may last for weeks, draw attention to the chest, but the physical signs resemble those of asthma in that the sputum is typical of that condition, frequently containing clumps of eosinophil cells, rarely Charcot-Leyden crystals or Curschmann's spirals The X-ray appearances are noted from the fourth to sixth weeks. The mottling is marked at the An average single focus is about the size of a split hilar regions and bases pea, with a moderately intense central shadow, of ill-defined, blurred outline The eosinophil response is higher than that in any other except eosinophilic The spleen was said to be slightly enlarged Most of the patients lived by the sea Tropical eosinophilia, frequently misdiagnosed as bronchial asthma or chronic phthisis, runs a benign course. The successful treatment by ncoarsphenamine was accidentally discovered when a patient, who also had syphilis, received injections of neoarsphenamine and this was followed by subsidence of respiratory symptoms and fall in leucocytosis fram 64.200 to 7800 per c mm, representing a fall in eosinophils from 71 to 16 per cent. Arsenical treatment of other patients with this syndrome was then undertaken with favourable results. Weingarten again does not think it is an allergic manifestation, but considers that it has no connexion with Löffler's syndrome.

It must be admitted that the evidence presented by these scattered communications bears much the same flavour, and, if confirmation were required, it comes from two military officers, A. W D Leishman and A R Kelsall<sup>8</sup> (1944), who, in a paper describing a year's military medicine in India, saw 8 cases in one hospital. In some the pulmonary radiographic appearances were normal, but others resembled the description of Weingarten All patients were Anglo-Indians or Indian and had been in coastal districts since childhood. They fully confirmed the beneficial results of intravenous neosalvarsan. After an initial rise the leucocytic count returned to normal. One of the most remarkable features of the eosinophilia is the almost immediate response to neosalvarsan and allied compounds, but what this portends no one at present can foresee, nor is it by any means clear from the evidence before us how exactly tropical eosinophilia is to be differentiated from Löffler's syndrome

There are other records in serving officers from this war. A typical case is described by B. G. Parsons-Smith (1944) in an English airman with bronchial spasm, severe malaise, and massive eosinophilia, but who eventually responded favourably to injections of neoarsphenamine and was able to return to duty. On the 173rd day of his illness the eosinophil count had fallen to 2 per cent. The illness was divisible into three periods—70 days during which the symptoms became chronic, 55 days in hospital without clinical improvement,

and 32 days after successful arsphenamine treatment. As other observers have noted, there was at first a slight increase of the total leucocytes as well as of the eosinophils which was accompanied by severe malaise and exacerbation of the chest condition

K Emerson, 10 in the US Naval Medical Bulletin, gives such an accurate picture of his case that there can be no doubt as to the identity of the disease. The interesting points about this case were that it was seen in a naval officer from India who presented the picture of intense asthma with eosinophilia Radiography showed pin-point pea-sized mottling of both lung fields. The asthmatical attacks continued till the patient was treated by carbarsone by the mouth, when they subsided and he was enabled to return to duty. Here again there was a preliminary rise of eosinophils, succeeded by a rapid decrease. This interesting case was complicated by an acute abscess in the left lobe of the liver in which a hæmolytic staphylococcus appeared to be the exerting agent.

Löffler's syndrome, essentially the association of eosinophilia with pulmonary infiltration, was first put upon a solid basis by Löffler<sup>11</sup> in Switzerland in 1982 and again in 1986. A reference to his most complete paper in the latter year, and a perusal of the numerous radiograms which illustrate it, seem to show that his conception does not differ materially from the evidence collected elsewhere which has already been surveyed. The maximum incidence of the Swiss cases occurs in the summer months of July and August. He concluded that this transient eosinophilic infiltration represents a microbicide of the lung tissues, is of the same nature as a tuberculide in tuberculosis, and in his final assessment he is supported by the majority of Swiss specialists, to whom this syndrome appears to be well known.

Parkes Weber<sup>13</sup> (1989), who suspected this syndrome in a boy of 10 with a very moderate eosinophila of 7 per cent whom he had diagnosed in England, suggested that sufferers from this syndrome might show an excessive reaction to histamine which would suggest an allergic basis of this disease. It therefore seems reasonable that we should agree with T. Apley and G. H. Grant<sup>13</sup> (1944), in their very complete survey in the case of an Englishman invalided from Bengal with this condition, that Löffler's syndrome and tropical eosinophila are probably indistinguishable, but whether or not, as appears improbable, splenomegaly, as claimed by Weingarten and Parsons-Smith, is an essential part of the latter, still remains to be settled

The criteria of these two syndromes are set out as follows -

Loffler's Syndrome	TROPICAL EOSINOPHILIA	
1 Recorded in Europeans 2 Dry European climate	1 In all races 2 Tropics, near sea or in humid atmosphere	
8 Mild disease, lasting a few days, temperature raised 1 or 2 days	8 Acute febrile onset lasting a few weeks, then becomes chronic	
4 Variable transient eosinophilia (up to 66 per cent)	4 Variable persistent eosinophilia (up to 89 per cent)	
5 No splenomegaly recorded 6 X-ray shadowing of the lungs variable in type, but always resolving quickly 7 Speedy spontaneous recovery	5 Splenomegaly in acute phase 6 Disseminated mottling of both lungs in second part of illness, after acute phase 7 Chronic, unless treated with arsenic	

N. Alwall<sup>14</sup> (1943) has described briefly four further cases in Switzerland Examination for pneumococci must not be omitted in refractory cases, as the benefits derived from sulphathiazole therapy are great.

A critical paper by E Sommer<sup>15</sup> has now become available. He agrees that eosinophil infiltration is an allergic reaction of the lung and can be produced by various substances such as pollens. The same allergens which cause urticaria in sensitized persons, in whom the skin is the reacting organ, may also be the cause of eosinophilia. When ascaris sensitivity exists there may be several exciting causes of eosinophil infiltration of the lung. When such a person is sufficiently sensitive, the swallowing of a single ascaris egg may suffice to release an eosinophil infiltration of the lung. This is similar to the urticaria of persons sensitized to various allergens, including ascaris material

To find out whether a patient is sensitized, Sommer has prepared an oint-ment containing antigen from human ascaris and rubbed this into the skin below the clavicle of a patient from whom an ascaris was obtained, and also into the skin of others, including some worm carriers. The reaction of these was negative. When rubbed into a sensitized patient a marked itching urticaria was produced.

Transitory acute pulmonary symptoms with eosinophilia, suggesting Löffler's syndrome, were observed by Claveaux and his colleagues<sup>16</sup> in an outbreak of trichmasis, and transitory consolidations of the lung with pyrexia, cough, and expectoration of muco-purulent or sanguineous sputum ensued Similar transient pulmonary infiltrations with eosinophilia of lesser degree (8 per cent) have been recorded in Cuba by Quintana,<sup>17</sup> in association with Necator americanus infection. To the impartial observer, however, the evidence in these latter communications appears to rest upon rather slender foundations.

"The Occurrence of Mites (Acarma) in Human Sputum and their possible Significance" is the title of a paper by H F Carter, G. Wedd, and D'Abrera<sup>18</sup> (1944), and is an interesting development. Various species have been detected in Ceylon in the sputum of 17 out of 28 persons examined. Twenty-four of these were under observation or receiving treatment for respiratory disorders Precautions to prevent contamination having been taken, at least 10 species of mite, some as yet unidentified, were found in the sputum. Those identified included species of Tyroglyphus, Carpoglyphus, Glyciphagus, Cheyletus, and Tarsonemus, which are not parasitic types, but are commonly present in stored products and debris

In three of the mite-infested patients an eosinophilia of 38-66 per cent was observed. In all of these the chest condition improved and the eosinophilia was much reduced with arsenic Prior to treatment with arsenicals, mites were found in small numbers in approximately 50 per cent of sputum samples from the mite-infested patients, and they diminished in numbers subsequent to arsenical treatment

It is considered that the evidence obtained suggests that the mites in the sputum were derived from the lungs and bronch. Possibly in one case the mites had adapted themselves to the conditions and were breeding. The evidence also suggests that the chief method of infection is by inhalation Finally, the view is advanced that pseudo-tuberculosis, 'eosinophil lung', or tropical eosinophilia, may be partly explained on the basis of mite infestation

Endoparasitism by mites in man has so far been incompletely studied, so far only in relation to infestation of the alimentary and urinary tracts. Invasion by Tarsonemus and Tyroglyphus mites is believed to have been responsible for gastro-enterocolitis, nocturnal enuresis, hæmaturia, and albuminuria. The parasite in the urinary tract is usually T. farinæ. A. Hase (1929) has published a review of the literature of this subject

Endoparasitism of the respiratory system by mites is known to occur in insects, especially hymenoptera, birds, reptiles, and some mammals, notably

certain Old World monkeys Mites of the genera *Pneumonyssus* and *Pneumotuber* are true parasites infesting the lungs and air-passages and capable of causing serious pathological conditions, but the mites found in human sputum are not related to these species, but are mainly non-parasitic types which normally occur in stored products, decaying matter, and debris of all kinds Obviously this subject requires further investigation and confirmation

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# TUBERCULOSIS: INCIDENCE, MORTALITY, AND HEREDITARY FACTORS. Ralph M F Picken, M B, Ch B, B.Sc., D P H.

Morbidity and Mortality Statistics.—The rise in the death-rate from tubercuculosis in 1940 and its subsequent decline have been attributed to various causes, but it is only recently that this phenomenon has been closely analysed and correlated with the continuous increase in notifications from 1940 up to the end of 1943 P Stocks and E Lewis Faning have thrown light on the changes of incidence and mortality from the respiratory form of the disease An earlier investigation by Lewis Faning<sup>2</sup> into the lapse of time between notification and death among 3811 cases dying in Middlesex afforded means of estimating the probable rate at which notified cases would die off throughout England and Wales Thus it is calculated, in relation to 60,443 deaths during 1937-39 of notified persons, that of every 100 cases notified 22 2 per cent would have died by the end of one year, 44 2 per cent in five years, 48 6 per cent in ten years, and 49 5 per cent in fifteen years Adjusting these rates of attrition to each separate year of survival the writers have been able to estimate from the notifications from 1925 onwards the expected number of deaths in 1935 and each subsequent year up to 1943, and to compare these estimates with the actual number of deaths certified in each of these years There was reasonably good correspondence up to 1989 if allowance is made for irregularities caused by outbreaks of influenza and exceptionally rigorous weather In 1940, however, the actual exceeded the expected deaths by 2800 and in 1941 by 1900, followed by deficits in 1942 and 1943 (provisional) of 1000 and 1200 respectively The excess in 1940-41 was, therefore, probably due to the accelerated death of cases, in these years of stress and exceptionally bitter winter weather, which would normally have swelled the death-lists of the subsequent years Probably 2500 cases, representing three-quarters of the increase in deaths in 1940-41 as compared with 1938-39, died in this way before their time, for the 1943 figures were themselves swelled by influenza. The rest of the excess deaths in 1940-41 over expectation, amounting to about 1500, may be explained by the breakdown of persons in whom the disease had become quiescent and who would not have died from it at all in normal To this has to be added an increase of 1000 deaths above the normal certifications of unnotified patients If the pre-war rate of decline of notifications had not been interrupted the expected deaths would have fallen still further short of the actual by a figure estimated for the four years 1940-43 at 6000, of which 1948 naturally contributed the biggest share, namely, 3000

Discussing these and other statistical questions in a further article on respiratory, tuberculosis, Stocks<sup>3</sup> points out that the expectation of eventually dying of the disease was almost exactly one-half for the average case notified prewar, and that the average interval between notification and death was 2 2 years. He calculates that roughly 750,000 persons with a known history of

the unwary

respiratory tuberculosis were surviving in the community of England and Wales in 1938 Most would be in a healed or quiescent state, but, in addition, probably another 70,000 existed who had escaped notification, many of whom were elderly and probably passing as eases of "chronic bronchitis". He regards as reasonable an estimate of clinically active cases at any time in 1988 amounting to 80,000 to 100,000 previously notified and 10,000 not notified Expressed as a ratio, of every 10,000 of the whole population there would be 160 healed or quiescent cases and 24 active cases of respiratory tuberculosis; of all these about 15 would be expected to die of the disease some time in the A higher proportion of active cases say 40-50 per 10,000, may be expected among unselected groups of young adults and still more if radiological means of ascertainment are used Stocks points out that the excess of notifications in 1940 was confined to males aged 20 to 40 who were then being called up, and in 1941 it spread to males under 20 and females aged 20 to 80 who then began to be called Altogether during the two years 1941-42 as many as threequarters of the great excess of notifications over 1938-39 probably arose from national service examinations and the consequent unusually early detection of the disease. Only a fraction, however, of the continued increase in 1943 could be attributed to this cause Now that the trough of mortality following the

premature deaths of patients in 1940–41 is nearly spent, and in spite of the fact that some 6000 deaths have already resulted from the war-time increase in new cases, a secondary rising wave of deaths is likely to be the debt to be paid for the continued increase in notifications. Stocks also emphasizes the importance of standardizing the descriptive terms to be used, especially in connexion with new means of ascertainment such as mass radiography, and urges adherence to the MRC code of classification. Otherwise mass statistics of morbidity will become a welter of contradictory figures full of pitfalls for

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Inherited Susceptibility to Tuberculosis.—Stocks remarks that there is a tendency to ignore the existing statistical evidence about heredity. While it has been generally believed that one of the factors determining the incidence of tuberculosis is genetic, the isolation of this factor from the many others affecting a person's liability to contract the disease is difficult. Consanguinity, co-habitation, exposure to infection, deprivation, and the other stresses of life are hard to disentangle in the study of an infectious disease, which, although it is known to be largely familial, may be influenced by any one or all of these circumstances. By the study of the incidence of the adult, or re-infection, type of tubercle in twins, their parents, their full siblings, their half siblings, and their marriage partners, F J Kallmann and D Reisner<sup>5</sup> have conducted what appears to be a crucial investigation Their material emanated from cases of tuberculosis occurring in any twin-the "index cases"-diagnosed at the clinics of New York State and City over a period of five years whose relatives could be fully traced and examined The relatives were followed up and submitted to careful clinical examination, and, in particular, it was determined whether the twins were monozygotic or dizygotic. Altogether 308 twin pairs, 1 e., 616 twin partners (of whom 334 were index cases), 930 full siblings, 74 half siblings, 688 parents, and 226 marriage partners of twin patients, a total of 2534 persons, formed the material of the survey The proportion of monozygotic to dizygotic twin pairs, 78 to 230, was according to general expecta-The incidence in the several groups of relatives are briefly stated in tion the table on p. 338

The rate for the general population is based on New York State's experience. The correction applied to the rate is a method of standardization for age-distribution allowing for the chance of succumbing to the disease of those not

yet past the period of greatest risk, namely, from 15 to 29 years of age. It is obvious, however, that the essential conclusions are not materially affected by its validity. Detailed analyses were made to exclude other factors which might have influenced these rates, such as the age of onset in index cases, sex, and parental taint, but none of them proved significant. It is concluded that the chance of developing tuberculosis increases in strict proportion to the degree of consanguinity, and that the risk of a monozygotic twin contracting tuberculosis,

		RELATION TO TUBERCULOUS INDEX CASES					
	GENERAL POPULATION OVER 14 YEARS	Marriage Partners	Parents	Half Siblings over 14 Years	Full Siblings over 14 Years	Dizygotic Co-twins	Mono- zygotie Co-twins
Morbidity-rate per cent — Crude Corrected	1 08 1 37	62 71	16 6 16 9	9 5 11 9	18 9 25 5	18 3 25 6	61 5 87 3

if his co-twin is affected, is 3.5 times as great as that of either a dizygotic twin or a full sibling. When the clinical severity and fatality of the disease are compared, the difference of risk is even more striking, being 16 to 1 against the monozygotic twin. These findings cannot be explained by any correlation between closeness of blood relationship and increased similarity of environment. They indicate that liability to contract tuberculosis, and even more the degree of severity of the disease when contracted, are substantially influenced by heredity

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TUBERCULÓSIS, PULMONARY. (See also HEART DISEASE, CONGENITAL—PULMONARY TUBERCULOSIS IN, MASS MINIATURE RADIOGRAPHY OF THE CHEST.)

Maurice Davidson, M.D., F.R.C.P.

Infection.—The significance of massive primary infection in tuberculosis has long been a matter for discussion in connexion with the problem of phthisiogenesis. That the size of the primary infecting dosc is a factor of importance in determining the subsequent course of events is held by most observers to be at least one of the probable hypotheses, if not an accepted theory E. Fraenkel¹ discusses the significance of the massive dose in tuberculous infection, pointing out that the varieties in virulence of the organisms do not correspond to the wide divergence of the pathological tendency in human disease, and insisting on the importance of the influence of other factors. e.g., age, hormonal revolutionary periods, nutrition, physical and mental strain, and so forth. In commenting on the generally accepted view that the unfavourable effects of a primary massive infection is beyond question, the author maintains that the term massive infection has been used without strict recognition of its procedure. He concludes from prima facie considerations that the primary focus is usually due to a very small number of bacilli and that this is independent of the actual exposure, which may have been occasional, protracted, or massive. Arguing from this consideration he favours the suggestion put forward by Redeker as long ago as 1930, namely, that "what is called massive primary infection may be interpreted as the inoculation of a

small or even minute amount of bacilli, just as in the case of the non-massive infection, but directly followed by repeated invasion of bacilli with their toxins stimulating the primary focus during its earliest stage and its exquisite reactivity. the stimulated focus would be more active, more liable to either immediate or postponed extension than the non-stimulated focus of the occasional non-massive infection."

O G Hansen<sup>2</sup> contributes an interesting account of the work done in Norway, starting with the investigations of Olaf Scheel in 1924, followed by later ones in collaboration with Heimbeck, Ustredt, Dahl, and others on the percentage of tuberculin-negative reactors and the incidence of infection in these individuals at a later date. He reminds us that voluntary B C.G. vaccination of negative reactor probationer nurses was begun in 1926, and states that since 1927 it has been carried on more systematically, though still on a voluntary basis. Some opportunity for assessing the results of this work is afforded by the following table given by this author

RESULTS OF BCG. VACCINATION OF TUBERCULIN-NEGATIVE REACTORS

Tuberquiin-negative 1927–39	No of Students	AVERAGE YEARS OF OBSERVATION	No of Cases of Tuberculous Diseases	MORBIDITY PER YEAR OF OBSERVATION,
Non-vaccinated Vaccinated with BCG	272 384	3 8 5	85 14	per cent 4 3 1 2
Tuberculin-positive — Formerly healthy	872	41	11	07
Formerly suffered with TB illness	106	42	18	29

The results arranged in periods are given as follows -

Tuberculin-nega five	No of Students	AVERAGE YEARS OF OBSERVATION	No of Cases of Tuberculous Diseases	Morbidity per Year of Observation
1927–30 Non-vaccinated Vaccinated with B C G 1931–39 Non-vaccinated Vaccinated with B C G	79 128 198 211	85 41 29 82	10 10 25 4	per cent 8-7 , 200 3-6 0-6

The latest figures published (up to 1935) indicate that the total morbidity of tuberculosis was, for the non-vaccinated tuberculin-negative group 17 1 per cent, and for the vaccinated group 2 6 per cent, per year of observation: it was concluded from the figures available that the morbidity appeared to have been reduced to one-seventh

The author goes on to discuss the various difficulties associated with the administration of BCG and the set-back which occurred as the result of the Lübeck disaster, the disputes as to the innocuousness of the vaccine, and the disappointing results of the distribution in Norway at one time of a vaccine prepared from a strain which showed a very scanty or slow growth in the culture. He points out the extreme care necessary in the production of the vaccine, and the periodic precautions which have to be taken to test the virulence of the preparation that is being distributed. He gives the further information that during the war interest in this subject has increased in Norway this, he says, is due partly to improved methods of inoculation, partly to fear

of tuberculosis engendered by conditions during the earlier part of the war, and partly to the considerable increase in tuberculosis morbidity recorded during the last years of occupation. This has resulted in a rapid increase in the use of the vaccine

Primary Infection in Nurses.—The original investigations of Heimbeck on the incidence of primary tuberculous infection among probationer nurses and the subsequent course of events in the period succeeding the first examination, have been quoted extensively as a piece of pioneer work. In an interim report of the Prophit Tuberculosis Survey, M Daniels's has furnished an extensive and important series of observations on this subject. The report analyses a vast number of facts collected from one of the groups under observation in the survey and deals with investigations upon student nurses drawn from two main groups of large general hospitals The total number of such entrants to the Survey up to March, 1943, was 3764, and these were Mantoux tested and X-rayed shortly after their entry into the preliminary training school Of all the entrants, 50 3 per cent were positive to O.T 1-10,000 or 1-100,000, 80 5 per cent were positive only to 1-100 or 1-1000, 19 2 per cent were negative reactors. Furthermore, the rate of conversion from negative to positive reaction was determined, being in the two hospital groups 58 4 per cent and 78 8 per cent respectively in the first year Daniels notes that in the latter group there was a high proportion of strongly positive reactions demonstrating the conversion, the majority had no symptoms of importance between the last negative and the first positive tests Such are the main conclusions of the author's study of primary infection; the text of his report gives many important details relating to analysis of the nursing population, the intensity of the Mantoux reactions, the significance of negative reactions, and the various phenomena accompanying Mantoux conversion Space forbids more than a brief reference to these, but the text deserves close and intensive study in view of the large numbers of individuals in the series and the care and thoroughness of the investigation

Later in the report the author deals with the incidence of tuberculosis among the examinees after primary infection in hospital, with special reference to the question what resistance to infection is offered in young adults not previously infected, i.e., is resistance less or greater in young adults who were infected at some time in the past? In this connexion emphasis is very properly laid on the primary necessity of defining what is meant by a 'case of tuberculosis', and it is pointed out that, in order to avoid misinterpretation of the morbidity figures cited, it must be clearly understood that the term 'case of tuberculosis' is not synonymous with 'manifest phthisis' To accept in such an investigation only cases of manifest clinical disease would preclude satisfactory investigations on early pulmonary tuberculosis and would stultify much of the value of mass radiography. The criteria for the different phenomena are clearly laid down in an appendix drawn up for the guidance of Prophit research workers and include (1) Clinically active pulmonary tuberculosis; (2) Latent sub-clinical pulmonary tuberculosis, (8) Pleurisy, with and without effusion; (4) Healed tuberculosis. A second appendix gives exact and detailed criteria for the radiological diagnosis of pulmonary tuberculous lesions. In comparing the morbidity among cases which arose after primary infection with that in individuals who were Mantoux-positive on entering the Survey, certain of those coming under the heading 'latent sub-clinical pulmonary tuberculosis' (i.e., those in which a small lesion suggestive of a primary focus, associated with the development of a positive tuberculin reaction, retrogressed or disappeared completely within a few months) were classified separately in order to exclude them from the morbidity figures. The results of this part of the

investigation are fully discussed the actual statistics, which prima facie appear to be of the greatest significance, may with advantage be quoted here. All the cases mentioned in this section occurred in nurses after their entry to hospital, their X-ray examinations on entry having shown no significant abnormality In 452 nurses initially Mantoux-negative there were 33 cases (7 8 per cent), and in 2120 nurses initially Mantoux-positive there were 48 cases (208 per cent approx) Only those who entered the Survey before 1942 were considered in this section, observation being continued until April, 1948 The table of comparison between these two sets of cases is interesting as showing the types of lesion encountered

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	INITIAL I REAC		
	Negative	Positive	Total
Clinically active PT Latent sub-clinical PT. (progressive)	12 1	19 7	81 8
Latent sub-clinical P T. (progressive) Latent sub-clinical P T (non-progressive) Pleural effusion only	3 6	9 5	12 11
Pleurisy without effusion only Primary focus or complex, uncomplicated Non-pulmonary tuberculosis only	4. 6	=	6
Non-pulmonary tuberculosis only	1	8	4
Total	88	48	76

The difference in the results obtained of the follow-up of positive and negative reactors is striking, and one of the questions arising out of the preliminary study of these 33 cases of Mantoux-negative individuals is whether the lesion observed was the primary focus itself, and if not what relationship, if any, existed between the primary focus and the lesion observed. The discussion that follows on this point is of particular interest in view of the suggestions recently put forward by Luria and others on the so-called "progressive primary complex". Daniels considers that the answer must often be merely a matter of conjecture, and in regard to various attempts to deal with it on the basis for a time interval between Mantoux conversion or the last negative Mantoux and the appearance of the lesion, or else on the basis of the radiological and clinical aspects of the case, he feels that no rigid rule can be applied and that each case must be considered separately

The discussion on morbidity in relation to reaction on entry is one of the best parts of the whole report In this Survey the morbidity was seen to be two and a half times lower in those who were Mantoux-positive on entry than in those who were negative The results of reported surveys (1933-42) of the incidence of tuberculosis developing in nurses after entry to hospitals are given in tabular form. In the Prophit Survey the results were seen to be very similar to the combined results of the 20 other investigations quoted, although these when studied separately showed considerable divergence in their find-As regards the differences in resistance to infection, the author suggests that several factors are responsible, the three to which he chiefly devotes attention being. (1) acquired specific immunity, (2) individual resistance, and (8) frequency of infection The outstanding fact brought to light by his own studies is the higher morbidity shown in nurses who are Mantoux-negative on first observation in comparison with that in nurses who are Mantouxpositive Apart altogether from the obvious implications of this and their corollary in the practical recommendations made to general hospitals similar to those in which the Survey has operated, this study is a most valuable contribution to the literature of tuberculous infection and phthisiogenesis

those chiefly concerned with the practical aspects of this disease this report is strongly to be recommended for the most careful perusal. The author's concluding reference to protective vaccination is particularly apposite at the present time when the probable increase of disease as the result of the wide-spread increase of risk to susceptible individuals arising out of war-time conditions has loomed so large among present-day medical problems. Not the least of the ments of this Survey is the stimulus it is likely to give to attempts to replace the present fortuitous development of immunity to tuberculosis by some scientifically controlled process of vaccination on lines with which students of the subject are already familiar (cf. Hansen²)

Bovine Infection.—A recent communication by L J Cutbill and A. Lynn<sup>4</sup> dealing with bovine infection gives the results of investigations into the type of organism present in the sputum in 2101 cases of pulmonary tuberculosis undergoing treatment in the Cheshire Joint Sanatorium. This showed human 2052, dysgonic human 1, bovine 48. The percentage of cases of pulmonary tuberculosis due to the bovine type of bacillus was, therefore, 228, a figure which the authors state to be the highest so far recorded in England. That the incidence has been more common in Scotland has been shown by the summary drawn up by the late A S Griffith in 1938, for whose assistance the authors acknowledge their indebtedness in the present inquiry, which has been in progress since 1934. They call attention to the fact that, as in Scotland, it is the most rural population which provides the greater proportion of bovine infections, as appears from their table giving details of the population and incidence of phthiss in the part of England covered by their investigation, viz:—

	Population	PERCENTAGE OF TOTAL POPULATION	Number of Bovine Infections	Number per 100,000 of Population
City and urban	1,247,000	89	28	2
Rural	157,000	11	25	16

From their observations they conclude that infection from milk probably occurred in 16 cases (33 per cent) In 19 cases (40 per cent) no direct evidence of any source of infection was discovered, although milk-borne infection could not be excluded. Evidence of infection by direct contact with cattle was strongly suggested in 10 cases (21 per cent) The latter point is one on which, so far, there has been little comment by most observers Cutbill and Lynn are unable to say with certainty that in these 10 cases the lung lesion was primary, but in view of the absence of any evidence of alimentary tract infection, or of tuberculosis in early childhood, and in view also of the history suggesting an infection in adult life, they feel that an occupation which involves contact with cattle also involves the risk of contracting bovine tuberculosis. This, they maintain, is particularly noticeable among farmers Another interesting point arising out of their investigation is the possibility of direct infection from one human subject to another with bovine bacilli. Of their 48 bovine cases, 9 had a positive and 39 a negative family history. Of the 9 with a positive family history, 8 had relatives whose sputum contained bacilli of the bovine type In the three families in each of which two individuals were found to have pulmonary tuberculosis due to the bovine bacillus, the contacts were as follows family A, father and son, family B, father and daughter, family C, husband and wife In each family it seemed probable that the first-mentioned member was the first to be infected.

In two patients with bovine infection who were undergoing treatment by

artificial pneumothorax, pleural effusions developed from which the bovine bacillus was recovered

This is an important and far-reaching investigation, the results of which have been briefly but clearly summarized in this article, which is to be commended to the notice of all concerned in this vital problem of preventive medicine

#### TREATMENT

Pneumoperitoneum.—The principle of diaphragmatic hemiparalysis as a means of relaxation therapy in pulmonary tuberculosis is well recognized introduction of air or oxygen into the peritoneal cavity with a similar object in view is a comparatively recent procedure to which a good deal of attention has been paid in the last few years. As may be expected, the results of observations have varied a good deal and have not invariably justified the enthusiasm with which the treatment has sometimes been advocated deal of literature has accumulated in connexion with the subject I E Rudman<sup>5</sup> gives a useful résumé of some of the main points in regard to the scope and limitations of pneumoperitoneum in the treatment of pulmonary tuberculosis, with a short bibliography of some of the earlier literature, and cites 5 cases of his own of which details are given To those desirous of studying the subject this article is a good preliminary to some of the more recent accounts author makes clear the various indications for the use of this method as a test of diaphragmatic mobility prior to phrenic evulsion or crush, as a reinforcement of phrenic evulsion or crush, as a preliminary measure in cases in which a major radical operation is contemplated, and in which apart from some such procedure an unduly prolonged period of bed-rest appears necessary to attain quiescence of the lesions

E C Jones and N Macdonald, after a brief review of the literature, give a detailed account of pneumoperitoneum in the collapse therapy of pulmonary tuberculosis, with notes of 10 specimen cases They describe a method of technique and discuss the rationale of and indications for the treatment with special reference to its possible complications The article contains 16 good reproductions of radiographs The authors' site of election is a point 1 in below the tip of the 9th costal cartilage on the left side, the average amount of air given at an induction is 600 to 1000 c c. (a Rivière initial pneumothorax needle being used), refills of similar amount being given on the first two days after the induction, subsequently twice a week, and later once a fortnight attempt is made to assess the value of the treatment, but, as the authors admit, a larger series of cases, which they hope to publish later, is necessary to judge adequately its proper place

A. B Rilance and F C Warring give a summary of 101 patients with pulmonary tuberculosis who were treated by pneumoperitoneum as a supplement to phrenic paralysis They point out that in the first group of three patients (55) the pneumoperitoneum was induced as an experimental procedure and that some of them might have had a satisfactory result from the phrenic paralysis alone. In the second series (46), the pneumoperitoneum was started only after phrenic paralysis had failed to show the results hoped for with large cavities, persistent fever, or hæmoptyses, where the outlook appeared most favourable, pneumoperitoneum was induced at once in order to achieve the maximum elevation of the paralysed half of the diaphragm. Their results are summarized in tables The authors hesitate to dogmatize on the value of the treatment, but they found that the percentages of cavity closure and of conversion from positive to negative sputum were distinctly encouraging in those patients who showed an additional rise of 2 cm or more in the height of the diaphragm

S. M. K. Mallick, C L Malhotra, and N Mohammads report results of treatment in 176 cases of tuberculosis with therapeutic pneumoperitoneum, which they describe as a very useful therapeutic aid in certain selected cases. Their total series comprised 8 cases of unlateral pulmonary tuberculosis, 148 cases with bilateral disease, 5 cases of pleurisy with effusion, and 15 cases of abdominal tuberculosis. The results are tabulated, and so far as the pulmonary cases are concerned, show an appreciable proportion of cases improved (clinically and radiologically). These authors seem to have exercised a somewhat wider selection of cases than many, but they have drawn their conclusions from a fairly large series of patients, and their paper is a helpful contribution to our study of this subject.

Phrenic Paralysis.—F. L. Woolaston<sup>9</sup> gives some very useful figures showing the classified results of operation in 145 cases taken from a review of 265 consecutive operations. The author puts forward a plea for the employment of this method as a primary treatment in cases with early lesions of limited extent, in which he feels it may have a very real value. That this view is shared by not a few competent observers there is no doubt, and his article is a welcome source of information to those who feel that temporary phrenic paralysis has been neglected as a primary treatment in early cases. The author gives as the general indications for operation the control of hæmoptysis (3 cases), the relief of pain (4 cases), the consolidation of improvement already gained by sanatorium treatment (18 cases), palliation in advanced or extensive disease (30 cases), as an ancillary to pneumothorax therapy (64 cases), and, in the 145 classified cases of "suitable" early lesions, as a treatment of choice, or after failure to induce pneumothorax

The cases which he classifies as "suitable" were those in which the X-ray appearances indicated disease limited to less than half the lung and not of massive type. In 72 per cent it was limited to one zone, in 76 per cent a cavity was clearly visible before operation; the sputum was TB-positive in 64 per cent in which a cavity was seen, and in 37 per cent in which no cavity could be demonstrated. If after a month's bed-rest following the operation no definite improvement was evident, as indicated by shrinkage of the lesion, the cases were regarded as unsuccessful and other forms of collapse therapy were started. Results of treatment of "suitable" cases are classified as successful 58 per cent (84 cases), unsuccessful 42 per cent (61 cases). Tabular details are given of the situation of the disease, the size of cavities, the lung involved, and the rise of the diaphragm

This is a short but concise paper which should be carefully read and studied. The complications and disadvantages of pneumothorax therapy are not, perhaps, realized as fully as they should be by many who do not hesitate to recommend this form of collapse as a primary treatment without adequate realization of all that it implies and without fair consideration of the possible alternatives, which may save the patient incalculable inconvenience and even harm

REFERENCES.—'Tubercle, Lond 1943, 24, 79, "Ibid 1944, 25, 1, "Lancet, 1944, 2, 165, 201, 244, "Brit med J 1944, 1, 283, "Amer Rev Tuberc 1948, 43, 334, "Tubercle, Lond 1943, 24, 27, "Amer Rev Tuberc 1944, 49, 353, "Tubercle, Lond 1943, 24, 165, "Ibid 121

TYPHUS FEVER. (See 'BULLIS FEVER'; SCRUB TYPHUS.)

# UMBILICAL HERNIA IN CHILDREN: INJECTION TREATMENT.

Sir John Fraser, M.Ch., F.R.C.S Ed.

Since Mayer introduced the sac injection treatment for inguinal hernia in 1982, the method has gained considerable popularity. There are certain

advantages in the procedure, and, while there is general agreement that it lacks the certainty of the radical cure by operation, it is practised to an increasing extent

There appears to be no adequate reason why the technique should not be applied to certain types of umbilical hernia encountered in children, and M J Bennet Jones has used it with encouraging results. He selects cases in which the sac neck is one-third of an inch or less in diameter, and he reports that in many instances treatment by strapping had been tried previously without success Although general anæsthesia is not essential, he finds it advantageous to employ a light ethyl chloride narcosis, and the deep breathing associated with the anæsthetic ensures distension of the hernia sac, a feature which is important, because it permits accurate introduction of the sclerosing fluid, so that the risk of intrasaccular injection is avoided. He employs 5 per cent phenol in almond oil as the injection medium, and 45 cc are introduced The fluid is placed in the subcutaneous space around the sac neck, care being taken to avoid damage to the peritoneum. It is important that the hernia be maintained in a reduced state subsequent to the injection, and this is ensured by a compression gauze pad applied over the umbilious and secured in place by an encircling belt of elastoplast. The length of time during which the pressure is maintained is not stated, but it appears to be a matter of weeks, because it is implied that the support is continued until the sclerosing effect is complete

The results appear to be satisfactory, 42 patients of ages ranging from three months to five years received treatment, the majority (26) only a single injection, while 11 had two injections, and 4 required three, in one instance the procedure was repeated four times. Out of the 42 cases 31 appeared to be completely cured, 7 showed uncertain results but the author believes that cure would be secured ultimately, 2 cases were untraced, and 2 required operation because the injection procedure had proved unsuccessful

RFI ERF NCE - 1 Brit med. J 1944, 1, 78

#### URETER, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Obstruction at the Pelvi-ureteric Junction.—At a military hospital, in the short period of eight months, P. C. Mallam¹ encountered 12 cases of backache due to hydronephrosis of congenital origin. Seven of these patients had had appendicectomy performed previously because of vague pain believed to be due to appendicitis. Mallam concludes that backache in a young subject should always arouse the suspicion of hydronephrosis, and now that excretory pyelography is so readily available, these cases, which are not uncommon, should not drift from doctor to doctor misdiagnosed, as is so often the case

E. Hjort<sup>2</sup> had a case of necrosis of the kidney following division of aberrant renal vessels for hydronephrosis. This caused a urinary fistula, and nephrectomy had to be performed. In the next case of hydronephrosis due to aberrant vessels under his care, he devised the operation shown in Fig. 52. The result, as proved by pyelography a year later, was satisfactory

In obscure cases of renal pain due to a doubtful renal lesion, such as early stricture of the uretero-pelvic junction, C A. Wattenberg and D. K. Roses found that distension of the renal pelvis with sterile water through a ureteric catheter is often a valuable method of confirming the diagnosis. To establish the diagnosis the patient must state definitely that the pain produced is the same location and type as that which he has been experiencing. Failure to reproduce the pain does not exclude this diagnosis.

R. B. Henline and J. R. Menning do not consider that aberrant renal vessels are often the primary cause of obstruction at the uretero-pelvic junction. They

urge the surgeon not to be satisfied to find and sever an aberrant vessel and believe he has relieved the obstruction. A search must be made for other causes of hydronephrosis. In making the diagnosis of hydronephrosis requiring surgical treatment, the size of the kidney pelvis following retrograde pyelography is less important than determining the time of its emptying. Normally, contrast solution should drain from the pelvis within ten minutes. No one plastic procedure is sufficient for all types of pelvic hydronephrosis. It is the

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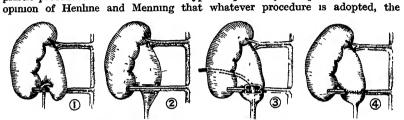


Fig 52—Hjort's method of circumventing obstruction due to large aberrant renal vessels

success depends on prolonged nephrostomy, drainage, and ureteral splinting, rather that on the type of plastic repair Following these dictates, they allow the splinting ureteral catheter and the nephrostomy drain to remain in situ for no less than six weeks!

In operations for reconstructing a hydronephrosis, for the last few years C. L Deming<sup>5</sup> has employed a No 12 T-tube similar to that used for a common bile-duct, and introduced into the normal portion of the ureter below the obstruction through a small longitudinal incision. The lower arm extends downwards for one centimetre, and the longer arm extends upwards into the reconstructed pelvis (Fig 53), thus obviating the necessity for nephrostomy

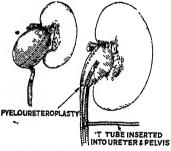
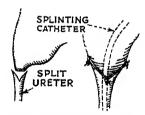


Fig 53—Method of draining a reconstructed pelvis of the kidney (After C L Deming)



The T-tube remains in situ for fourteen days, and is readily removed

Fig 54 —Wilhelm's method of pelvo-ureteric anastomosis.

In cases of stricture of the uretero-pelvic junction, where the renal pelvis is maccessible because it is intrarenal, D M Davis has split the ureter longitudinally through all its coats, and then intubated the ureter with a T-tube of such a size as to fit the normal ureter below the stricture without causing ischæmia. No attempt has been made to suture the split intubated portion of the ureter. If necessary, encircling sutures of plain catgut keep the ribbon of ureteric wall in proximity to the tube. At least three weeks should be allowed to elapse before the T-tube is removed. The results in 5 cases have all been excellent.

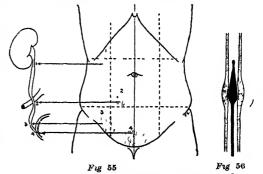
In order to avoid stricture at the site of anastomosis, after resection of the uretero-pelvic junction, S F Wilhelm<sup>7</sup> splits the ureter, and sutures the flap on the outside of the cut end of the renal pelvis (Fig. 54)

Implantation of Ureters into the Bowel.—W E Lower,<sup>8</sup> in reporting 6 cases of transplantation of the ureters into the recto-sigmoid for benign conditions, which had survived more than 20 years of active life, has come to the conclusion that the simplest operations give the best results

- J T Priestley and G W Strom<sup>9</sup> consider that the improved results obtained after implanting the ureters into the bowel are due, in part, to better preoperative and post-operative treatment. At the Mayo Clinic the bowel is prepared for four days with the same routine as is used before resection of the colon for carcinoma. During this time the patient receives a residue-free liquid diet, supplemented by candy and vitamins. Sulphasuxidine is administered every two hours during the four days of preparation. On the morning of the operation, rectal aspiration is conducted for thirty minutes at 6 a m and at 8 a m. After the operation, a rectal tube is kept in place for a week or ten days, and care is taken that the tube does not become occluded. Through the tube the rectum is irrigated with 2 fluid ounces of warm saline at frequent intervals. Low-pressure continuous suction facilitates removal of the urine from the bowel. For the first 24 hours intravenous saline and glucose is administered, and continued until the patient is taking adequate nourishment by mouth
- G. Grey Turner<sup>10</sup> has followed up for sixteen to thirty years after the operation on 9 patients with transplantation of the ureters into the bowel for being conditions. All were in good health. He states that the indications for this procedure are ectopia (the optimum age to operate is between four and six years of age), malignant disease of the bladder (combined with total cystectomy), mulignant disease of the cervix with extension into the bladder, intractable cases of vesico-vaginal fistula, and occasionally severe injury of the urethra associated with a fractured pelvis

In cases of ectopia vesicæ C C. Higgins advocates that the operation should be performed during the first year of life, preferably before the child is six months of age. The reason for this is that the operation can be performed before infection has been introduced into the kidneys. Postponement of the operation until the child is four years of age results in frequent deaths from renal sepsis. Of 19 cases in infants under one year, in 17 the operation proved highly successful Localized Ureteritis.—D. M. Morison considers that localized ureteritis

and consequent narrowing of the ureter is a definite clinical entity which is most amenable to treatment by dilatation of the affected ureter. The usual sites of localized ureteritis are depicted in Fig 55, together with the sites of abdominal pain arising from these respective ureteral zones While help can be obtained in the diagnosis from pyelography, the passage of a bulbed bouge is the most As the bougie certain method passes through the strictured



passes through the strictured area (Fig 56) a feeling of resistance is encountered and the patient experiences the pain of the ureter (D M Morison)

Fig 56.—Bulbed ureteric bourge engaging a stricture of the ureter (D M Morison)

which she complains The condition is much commoner in women. Treatment by dilatation is usually satisfactory. It can be combined with short-wave diathermy In a few rebellious cases denervation of the ureter should be entertained

Stone in the Ureter.—E E Ewert<sup>13</sup> believes that a patient with a stone in the upper part of the ureter is spared a great deal of distress by early removal of the stone by the lumbar route. In addition, there is an economic saving if this procedure is undertaken, rather than allowing the calculus to pass downwards and then having to remove it weeks or months later. A large number of patients treated by the latter method finally come to operation after repeated cystoscopies, a long stay in hospital, and the onset of urinary infection. Pre-liminary catheterization of the ureter aids location of the stone within it.

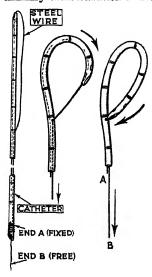


Fig 57—Balkus's looped ure tene catheter. The wire can be fixed to an ordinary ureteric cathe ter if the instructions given by the author are followed

the stone has been removed, when considerable infection is present, a small urethral catheter is passed up the ureter, so that its tip lies in the kidney pelvis. A closed drainage system is connected to this catheter, and a 0.8 per cent sulphanilamide solution is used as an irrigating fluid

V. A Balkus<sup>14</sup> gives instructions for altering a ureteric catheter, so that the end can be converted into a loop by means of a wire (Fig 57) If such a catheter can be insinuated beyond a stone in the ureter, the stone can be often caught up and extracted. If the catheter cannot be passed beyond the stone, the loop is of value for dilating the ureter, and thus aiding the passage of the stone

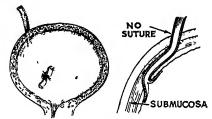


Fig 58—Re-implantation of a divided ureter into the bladder. (After Stevens and Marshall)

Re-implantation of the Ureter into the Bladder.—A R. Stevens and V F. Marshall<sup>15</sup> followed up patients who had had a ureter re-implanted into the bladder, and have shown that excellent kidney function results in many instances. Their technique of re-implantation is simple, yet it affords a valve (Fig 58). A small incision is made on the bladder wall penetrating the muscles only. A curved hæmostat bluntly dissects a channel under the mucosa for two or three centimetres. The nose of the hæmostat is then driven through the mucosa into the bladder, where it grasps the point on another hæmostat which retraces the path By this means the divided end of the ureter can be withdrawn into the bladder. The end is slit, and the two leaves are stitched to the mucosal and submucosal tissues by a suture of 0000 chromic catgut, giving a 'fishmouth' opening to the ureter.

REFERENCES — Lancet, 1944, 2, 110, Acta chir scand 1942, 87, 481, J. Urol. 1948, 50, 280, Ibid 1, Ibid 420, Surg Gynec Obstet, 1943, 76, 518, J. Urol. 1948, 50, 274; Ibid. 581, Ibid. 210, Ibid. 1987, 1987

#### URETHRA, SURGERY OF.

Hamilton Barley, F R.C S

Pın-hole Meatus (Plate XLV); Meatal Ulcer; Meatal Scab.—

Pin-hole meatus may be congenital or acquired.

Congenital pin-hole meatus is comparatively rare. The cause is failure of proper canalization of that epithelial column from which the glans portion of the urethra is formed. Usually the passage of a moderate-sized probe on a few occasions is all that is necessary to effect a cure (F. Welsh<sup>1</sup>)

Acquired pin-hole meatus is not uncommon; as F Welsh points out, the smallest meatus which is encountered is the one found in hypospadias, but spontaneous ulceration never occurs in connexion with this variety of pin-hole meatus

Meatal ulcer is an important clinical entity, which the practitioner should be able to recognize and treat. It is never found in the uncircumcised. It is common after circumcision, though an interval of three to eighteen months may elapse between the operation and the onset of symptoms. Lack of protection given by the prepuce is the initial cause. Friction of the clothing and ammoniacal urine are important secondary actiological factors. The ulcer causes a scab to form which closes the meatus (Plate XLVI), and the child can only urinate by bursting this scab. This process is usually accompanied by pain and screaming, and a few drops of blood may be passed. Ulceration and scab formation alternate, and if not treated in time, cicatricial contracture of the meatus gives rise to acquired pin-hole meatus.

M F Campbell<sup>2</sup> says thousands are suffering from serious progressive urinary obstruction because of the failure of their medical advisers to recognize this condition. The utter simplicity of diagnosis by inspection (see Plate XLV) causes M F Campbell to call this the neglected stepchild of serious urinary obstruction. Tight phimosis often accompanies a normally situated stenosed meatus. Urethral stenosis also commonly occurs in hypospadias. Back-pressure changes are usually greatest in the bladder. So-called persistent enurses and 'chronic pyelitis' of the young are common symptoms. The meatal ulcer syndrome is considered by Campbell to be due to atresia of the meatus, and not a sequel of it.

The treatment recommended by Campbell is liberal meatotomy with fine scissors or a small scalpel at the outset, and periodic subsequent dilatation. In children under one year of age, the meatus should be dilated to at least 16 French. In children from 2 to 5 dilatation must be maintained to 22 French. At the time of the initial instrumentation a small bought should be passed into the bladder, to make quite certain there is no other congenital urethral obstruction. Muco-cutaneous suture of the meatus is not required. It is important to instruct the nurse or mother to separate widely with her fingers the incised meatal margins every day. Weekly dilatations are necessary for five or six weeks, and the patient should be seen in six months' time to ascertain that the meatus is still of adequate calibre. Speaking of the meatal ulcer syndrome, Campbell states that he has yet to see a case not promptly and permanently cured by the establishment and maintenance of a wide urethral meatus.

[I have seen and treated many cases of meatal ulcer, and not once has the condition been sent correctly diagnosed. As to treatment, in the past I have advised the conservative régime outlined in the Medical Annual, 1941, and with a certain amount of patience a cure has always resulted. Since reading Campbell's splendid paper, I have followed his advice in two instances; cure resulted in three weeks—H B]

Meatotomy.—E. G Ballinger et al 3 say that meatotomy can be accomplished in the adult with little discomfort after injecting 1 per cent novocain into the tissue between the meatus and the frænum After incising the meatus to 30

French, as indicated by an appropriate bougie, the whole urethra is tested with a sound. The patient is instructed to introduce a glass rod about half an inch into the urethra every night for ten days. Carried out thus, meatotomy affords excellent results.

Stricture.—T L Lawson has encountered over 200 cases of neglected urethral stricture—a very common condition in Uganda When the stricture is a tight one, or is impassable, he performs suprapultic cystostomy. Ten days later a fillform guide can usually be passed, and on to this are screwed bougies of increasing size, in this way the stricture is dilated. When a No 12 rubber catheter can be inserted through the stricture, the suprapulsic wound is closed by operation.

Rupture.—B C. Murless<sup>5</sup> encountered a case of an intrapelvic rupture of the urethra in a soldier aged 19, where death occurred from extravasation of blood into the pelvic and retroperitoneal cellular tissues Clot extended to the lower pole of the left kidney The iliac vessels were intact, and it is presumed that the hæmorrhage came from the inferior vesical or middle hæmorrhoidal vessels

Papilloma.—E W. Riches<sup>6</sup> describes 6 cases of papilloma of the urethra, of which there are two varieties (1) A villous growth, resembling a papilloma of the bladder found in the posterior urethra; (2) A sessile wart, found in the anterior urethra and sometimes associated with papillomata of the glans penis. The posterior variety is usually associated with hæmaturia, which may be so great as to necessitate blood transfusion. It is possible for a papilloma of the urethra to be completely missed if the examination is confined to cystoscopy. Urethroscopy is the key to the situation, and removal of the papilloma through the urethroscope, with a diathermy electrode, is an effective form of treatment.

The Female Urethra.—V. S. Counseller, in describing the anatomy of the female urethra, depicts it as being provided with an internal sphincter at the neck of the bladder and an external (voluntary) sphincter near the mouth of the urethra. There are also involuntary fibres surrounding the mid-urethra.

P. Schneider<sup>8</sup> finds that the Halban operation for the treatment of stress incontinence gives satisfactory results. He says there are two sets of muscles in the

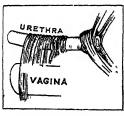


Fig 59 —The sphincters of the female urethra (After Schneider)

female urethra—the upper one, just below the bladder neck, which consists of two loops operating in opposite directions, and the lower, the lowest fibres of which, in addition to embracing the urethra, pass round the vagina (Fig 59). The Halban operation is founded upon the belief that the incontinence is caused chiefly by bladder-neck displacement. It corrects the associated cystocele, narrows the urethral lumen, and, what is most important of all, if the operation is performed correctly, a buttress is constructed beneath the bladder neck which elevates that structure to a normal level and allows the internal sphincter, which is seldom damaged, to act

V S Counseller, of the Mayo Chnic, performs an almost identical operation, which he calls Kennedy's operation. He agrees with the principles enunciated above and emphasizes the importance of an additional mattress suture, "Kelly's stitch", which should be placed near the internal sphineter.

stitch", which should be placed near the internal sphincter.

H. W. E. Walther' says all urethral caruncles, after excision, should be subjected to histological examination, and in this way the occasional early carcinoma will be discovered. The age incidence of both caruncle and carcinoma is the same, and both occur most frequently in multiparous women past the menopause. The first step in removing a urethral caruncle is to overdilate the urethra. For this purpose the author's female catheter (Fig. 60) seems a

### PLATE XLV

### THE DIAGNOSIS OF PINHOLE MEATUS





By compressing the meetus between a finger and thumb interoposterioris the hips of the meetus are opened, and it can be at once observed if the ordice is idequate

Plates N.1.1, N.1.1 I (Fig. 4) from Hamilton Bailey's 'Physical Signs in Clinical Surgery'



# $PLATE \lambda LVI$

# MEATAL ULCER OF INFANTS



Fig. 1 -Me it dillect with selb formation. A common cause of sereming on urmation.

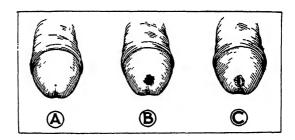
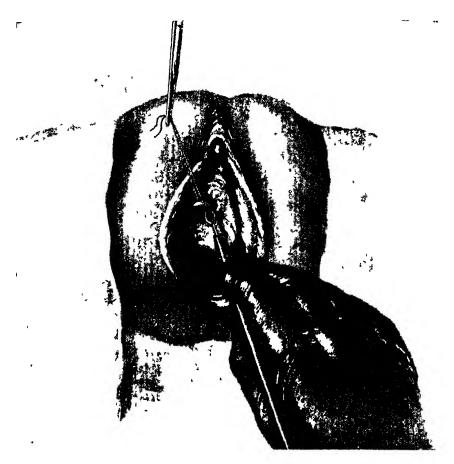


Fig. B. A, Publok meatus , B, Scab scaling the urmary meatus , C, Mc et al. ulcer. Clinically, meatal ulcer and scab ulternate

# PL 1TE XLVII

# URETHRAL CARUNCLE

(H W L WAITHER)



Removing a urcthral cuuncle Walther's technique ( tfter H = W = F = Walther )

useful instrument, and also for the after-treatment. When dilatation has been accomplished, a deeply-placed suture is passed through the base of the caruncle, which is thus brought well into view. The caruncle is then removed with



Fig 60 -Walther's female catheter-dilator

cutting diathermy current (*Plate XLVII*) and bleeding controlled by coagulation Whatever treatment is adopted, dilatation of the urethra should be continued for many weeks after the operation

REFERENCES — Brit med J 1944, 1, 352, \*J Urol 1948, 50, 740, \*J Amer med As: 1948, 123, 599; \*East Afr med J 1943, 20, 328, \*Lancet, 1944, 1, 111; \*Brit J Urol 1944, 16, 12, \*Amer. J. Obstet Gymec 1948, 45, 479, \*Urol cutan Rev 1944, 48, 134, \*J Urol 1943, 50, 380.

#### URINARY THERAPEUTICS.

Hamilton Bailey, FRCS

B Hughes¹ emphasizes that to obtain the full value of mandelic acid therapy it is necessary to limit the fluid intake to below 2 to 2½ pints per diem. The necessary concentration of the drug (0.5 to 1 per cent) in the urine is thereby obtained. J E Semple² says that the mandelic acid treatment of B coli infections of the urinary tract still remains the basic treatment, in spite of the success of the sulphonamide drugs. For successful mandelic acid treatment the fluid intake must be reduced to two pints per day, and the acidity of the urine should be increased by the administration of ammonium chloride, 30 gr four times a day

A. A F Peci<sup>3</sup> says that while urinary antiseptics are required later, they should not be employed in the early febrile stage of acute pyehts. Alkalis should be given in an amount sufficient to render the urine alkaline. For an adult, treatment may be started by giving 20 gr of citrate with 20 gr of sodium bicarbonate four-hourly. Each specimen of urine should be tested. If the dosage is insufficient to produce alkalinity, it must be increased until the urine becomes alkaline. The amount of alkali needed to secure alkalinity may be considerably in excess of official pharmacoposial doses, especially in the case of children. There is little danger of causing alkalosis provided each specimen of urine is tested and the dosage controlled accordingly.

J. H. S Whyte advises that a daily urine examination should be undertaken when giving sulphaguanadine or sulphasuaridine. Colourless rectangular crystals of varying size easily recognized by their uniform shape and giving sulphonamide colour reaction are present in the urine, and unless the urinary intake is high, crystal colic and possibly crystal anuma may develop.

P. M. F Bishop and S. J Folley<sup>5</sup> studied the effect of crystalline pellets of various hormones, particularly testosterone, implanted into animals. They do not disintegrate and are uniformly absorbed

Soothing the Inflamed Bladder.—The instillation of cod-liver oil into the bladder is particularly beneficial in patients with infected residual urine, for it continues to exert a soothing effect for some time. It has been recovered as long as three weeks after instillation. The maximum dose recommended is 2 oz and an instillation twice weekly is suggested. L R Reynolds and T. R Schulte's do not consider it necessary to boil or autoclave cod-liver oil

REFERENCES — Med. Chn N Amer 1948, 27, 1559, Med Pr 1948, 209, 847, Practitoner, 1948, 151, 347, Brit. med J 1944, 1, 878, Lancet, 1944, 1, 484, Trans Western Sect Amer urol Ass 1942, 5, 11.

URINE, RETENTION OF. (See PHARMACOLOGY AND THERAPEUTICS)

VACCINATION. (See Small-pox and Vaccination.)

#### VINCENT'S INFECTION.

F W. Watkyn-Thomas, F R C.S

E C O Dewsbury¹ warns us against the misuse of intravenous N.A.B. in this condition. The lesion is purely local; attempts to isolate the organism from the blood-stream in infected patients have never succeeded. Therefore local application is the logical method. Furthermore, cases have been reported in which patients under treatment for syphilis with intravenous N.A.B. have developed Vincent's angina. He describes 2 such cases in his own experience. In one case 5 g of N.A.B had been given, in the other a full first course of 5 5 g had been given and the Vincent infection appeared when 4 65 g. of the second course had been given, and the patient was jaundiced. Both cases cleared up entirely, one on mouth-washes and meotime acid, the other on mouth-washes and local application of 10 per cent chromic acid.

Dewsbury believes that intravenous administration of NAB in these cases is not only useless and wasteful, but is not without danger. There is little evidence that locally the arsenical compounds are any more effective than hydrogen peroxide. The best and simplest treatment is nicotinic acid by mouth in large doses, with local application of 10 per cent chromic acid and mouthwashes of hydrogen peroxide.

REFERENCE -1Brit med J, 1948, 2, 369

#### VITAL STATISTICS.

Percy Stocks, M.A., M.D., D.P H.

We are so accustomed to remarking upon small upward and downward movements of birth-rates and death-rates that it is difficult to realize that the expectation of any stability in these ratios is a relatively modern conception, dating from John Graunt, who first demonstrated, in 1665, the regularity, when studied in mass, of such vital phenomena. The realization that social events followed definite laws of probability, when studied in quantity, led to all kinds of advances in social science such as life insurance and the building up of a national system of vital statistics which prepared the way for public health administration and health insurance 
In these developments the medical profession has played, and continues to play, an indispensable part through the medium of the certification of deaths and of disabling sickness, the notification of infectious diseases, and the careful recording of hospital patients' histories, school medical, laboratory, and post-mortem data. Some of these activities are burdensome, but from experience of inquiries about death certificates the General Register Office can testify to the faithfulness with which they are carried out by the great majority of the profession. Despite some aversion to and cynicism about figures, there is in fact a belief and interest in vital statistics amongst many who are producing the raw data, and a review of progress in medical science which excludes this branch of research can hardly be considered as complete

Vital statistics comprise data affected to a considerable extent by a multiplicity of causes and, as the organization of society becomes more complex, demands for elucidation of the influence of this and that social factor on health and reproduction become more insistent. No longer satisfied with analyses by sex, age, place of residence, marital condition, industry and occupation, statisticians have had in recent years to pay attention also to housing, over-crowding within houses, income, and diet. The raw data include information derived from hospitals, insurance companies, welfare centres, and organizations conducting demographical researches, and statistics derived from such

sources, when adequately analysed and of special interest, will come under the scope of this section. For the most part, however, the vital statistics to be reviewed will be those collected on a national or local basis by the administrative authority concerned, and will fall into broad groups dealing with Population, Natality, Mortality, and Morbidity. Using these four divisions, which are necessarily interwoven at some points, a summary of the present position may be specially useful now in view of the war-time paucity of official reports

#### POPULATION

Although indirect methods of estimating the population were used in earlier times, census enumerations in Great Britain did not begin until 1801, and were repeated at ten-year intervals to 1931 The exigencies of compulsory national service and food rationing necessitated the preparation of a national register based in the first instance on a census, minimal as to detail and confined to the civilian population, on September 29, 1989 The register thus formed has been kept up to date since by additions to it of newly born children, immigrants, and persons discharged from the Services, by deductions from it of decedents, emigrants, and persons entering the Services, and by scrutimes at the time of reissue of ration books and identity cards By these means, and the obligatory notification of removals from one area to another, it has been possible in the midst of unprecedented disturbances to estimate the resident population of each local area at quarterly intervals. This has facilitated a proper distribution of food supplies and has furnished a basis for crude local vital statistics during the war. With regard to the sex and age constitution of the local populations, less is known owing to the large-scale movements of people of selected ages since 1939, but the numbers of children under 16 years of age in each area were ascertained from the register in 1943, and the sex-age compositions of the whole populations of England and Wales and of Scotland have been estimated year by year as in normal times

The census populations at generation intervals from 1821 to 1911, and the estimated mid-year populations in 1939, expressed in millions, were as follows, the European figures being derived from estimates compiled by F. W Notestein from official sources.—

Population of Europe at Generation Intervals (Millions)

YEAR	ENGLAND AND WALES	SCOTLAND	Northern Ireland	REST OF EUROPE (EXCEPI RUSSIA)
1821 1851 1881 1911 1989	12 00 17 98 25 97 86 07 41 46	2 09 2 89 3 74 4 76 5 01	1 25 1 20	  300 355

Successive census enumerations have provided information about occupations, birthplaces, and houses, as well as sex, age, and marital condition. In 1911 a special inquiry into the numbers of children born to married parents was added, and it was hoped to repeat this in 1941, but the census had to be postponed owing to the war

With regard to the composition of the population, two changes need to be kept in mind, which are affecting vital statistics profoundly at the present time. As a result of the decline in birth-rate during the half century ending in 1983 and the progressive fall in death-rates of the young and middle-aged, the proportion of people aged 65 and over in the population is rapidly increasing,

particularly amongst women. It is inevitable that this trend will continue for several decades, and the proportion over 65 may well reach 16 or 17 per cent, an expectation with obvious implications for the future of medical practice

	Poru	LATION OF	ENGLAN	d and W	ALES (MIL	Lions)		FA GE
YEAR		Males			Females		AGES OVER 65	
	0–15	15-65	65 and over	0-15	15-65	65 and over	Males	Females
1911 1921 1981 1989	5 53 5 29 4 81 4 42	11 11 11 81 13 05 13 91	0 81 0 98 1 27 1 59	5 52 5 22 4 71 4 81	12 04 13 29 14 42 15 10	1 07 1 81 1 69 2 18	4 G 5 4 6 7 8 O	37 66 81 99

The other point is that there has been in recent years a substantial increase in the proportion of young women who are in the married state. This can be seen by comparing the percentages in 1988, 1939, and 1940, derived from Table EE of the Statistical Reviews, with those given in Table 23D of the Census of England and Wales (General Tables), 1931

AGE	PER	CENTAGE (	of Women	AT THE	AGES STAT	ED WHO V	vere Mar	RIED
GROUP	1891	1901	1911	1921	1981	1988	1989	1940
15-20 20-25 25-35 35-45	1 9 29 6 65 8 76 1	1 5 27 2 64 8 75 1	1 2 24 2 63 2 75 3	18 270 631 746	1 8 25 7 65 8 75 2	2 8 32 8 68 7 76 9	2 7 33 5 69 8 77 1	87 880 724 775

The proportion of women under 25 who are married was as low as one-quarter in 1911, and was less than 30 per cent during the first three decades of the century, but by 1940 it had increased to over 40 per cent. This rapid change began some years before the war, and its salutary effects on the birth-rate are clearly of some importance.

#### NATALITY

Prior to the Population (Statistics) Act of 1988, the information obtained at birth registration was confined to dates, place of occurrence, names of parents, and rank or occupation of the father. The Act enabled confidential data to be obtained regarding age of mother, marriage duration, and number of previous children, and the statistics derived from it for 1938 (July-December), 1939, and 1940 have been published in the annual reports of the Registrars-General of England and Wales and Scotland. As by-products they tell us what is the frequency of multiple births according to the mother's age, and what are the relative risks of stillbirth according to mother's age, parity, and type of birth. In the tables below the data on these two points from England and Wales for the  $2\frac{1}{2}$  years have been combined in order to calculate the rates.

TWIN AND TRIPLET CHILDREN OUT OF EACH 1000 BORN TO MARRIED MOTHERS OF VARIOUS AGES

	Under 20	20-	25	80-	85-	40 AND OVER	ALI AGES
Twns— Lake sex Unlike sex All twins Triplets	10 1	11 7	14 1	17 4	20 9	15 9	15 1
	8 8	5 8	7 5	10 6	12 6	8 6	8 8
	18 4	17 0	21·6	28 0	33 5	24 5	28 4
	0 16	0 25	Q·22	0 87	0 40	0 32	0 29

Twins of unlike sex form half of the fraternal (or dizygotic) twins, since a brother-sister pair is just as likely to occur as a like-sex pair in this kind of twinning. The expectation that a maternity will produce a pair of fraternal twins evidently increases greatly with the mother's age, from 3 3 per 1000 at ages under 20 to 12 6 per 1000 at ages between 35 and 40, and it then falls. The expectation that a pair of identical (monozygotic) twins will result is given by half the difference between the two rates, and this changes little with age, being about 3 3 per 1000 up to 35, 4·1 at 35–40, and 3 6 after 40. The excess at 35–40 is difficult to explain; it was not present in 1938 when the rate was 2 7 per 1000, but in 1939–40 1640 pairs of like-sex twins were born to mothers of these ages and 943 pairs of unlike sex, so about 700 pairs must have been of the identical type, giving the higher frequency of 4 5 per 1000 maternities in those years

The chance that a maternity will produce multiple births can be found by adding half the total rate for twins to one-third of the rate for triplets in the above table. At ages under 20 the expectation is about 1 in 150, between ages 20 and 30 about 1 in 100, between 30 and 35 about 1 in 70, between 35 and 40 about 1 in 55, and after 40 about 1 in 80

Stillbirths, expressed as proportions per 1000 total births, have declined in frequency to a surprising degree in England and Wales during the war, as indicated below.—

1985	1936–87	1938–89	1940	1941	1942	1948
40 7	39 8	88 0	86 1	84 4	88 0	80 2

The risk that a child will be stillborn depends on the mother's age and parity, and whether the pregnancy is single or multiple, as shown by the following rates in 1938-40 —

Age of Mother	Srna	Births A	T SINGLE OF	Marerni The Birt	ries (Legiti fii-order St	MATE) PER I	1000 Снт.	DREN
	lst	2nd	8rd	4th	5th-6th	7th-8th	9th or Later	All Orders
Under 28 25-35 35 and over	29 43 81	18 28 40	22 27 43	28 30 49	26 85 54	40 56	47 64	26 88 55
All ages	39	21	80	86	43	51	61	35

At single maternities the risk is greater for the first-born child than for subsequent children whatever the mother's age, except at 25-35 when 9th and later children have a higher stillbirth risk. It is lowest for the 2nd child and then increases step-by-step with parity. For children of a given birth order the risk is about twice as great at ages over 35 as it is at ages under 25. At multiple maternities of married women of all ages the stillbirth-rate was 68 per 1000, or double that for single births.

The danger of maternal death also depends upon age and parity. In 1988 the fatality was about 18 per 1000 at the birth of a first child, 08 at births of 2nd and 3rd children, 12 at 4th to 6th, and about 16 at births of higher order

The problem of population replacement, though not primarily medical, is one which concerns the profession from many aspects, and the elementary facts about it should be grasped. The Population Act statistics have made it possible to calculate the numbers of girl babies born alive to women of each age in each year; and by aggregating the rates throughout the reproductive

period a gross reproduction rate can be obtained which indicates the extent to which the female population is replacing itself on the assumption that every child will survive to maturity. By applying the current survival rates to each group of girls a net reproduction-rate can be deduced, based on the assumption that rates of survival will not improve whilst the infants now being born are growing to maturity By making further allowance for the anticipated continuance of the fall in mortality, corrected reproduction rates have been calculated by the Registrar-General to indicate the degree of replacement which is most likely to result from the current birth-rates 2. In the period 1927 to 1933 the net reproduction-rate was below unity and still declining; from 1983 to 1988 it improved slowly from 0 738 to 0 805, and the corrected rate from 0.747 to 0.810 This improvement was interrupted in 1940-1, but a rapid recovery occurred between 1941 and 1948, bringing the corrected rate to about 0 90. The birth-rate has continued to rise since, and it may well be found that in 1944 the net and corrected reproduction rates were little short This recovery during the war was helped by several factors, notably by the large increase in the proportion of young women who are married, tending to offset the effect of absence abroad of so many husbands. The cumulative effect on the future population of the deficiency of births since 1927 will remain, even if the rate of replacement can now be maintained at parity, and if it is to be counteracted, a reproduction-rate considerably above unity will be necessary for some years

#### MORTALITY

Recent landmarks in the history of the evolution of mortality statistics have been the change in the form of medical certificate of death in 1927, and, as a natural sequel to this, the classification of deaths certified as due to more than one cause according to the preference expressed by the certifier. The latter change came into operation in 1940 along with the fifth revision of the International List of Causes of Death The Registrar-General's Statistical Review for 1939 tabulated the deaths of that year both by the old system of fixed rules of preference and by the new system and revised list. The 1940 review provided corrected annual death-rates back to 1931 and a series of factors for correcting the figures of years prior to that. The responsibility for deciding which was the primary cause to be used for classification now rests upon the medical profession to a larger extent than before, and the accuracy and usefulness of the vital statistics of disease depends upon the heathfulness with which doctors endeavour to record the causes of death to the best of their ability

It is often said that we have no confidential death certification, but provision is made so that the certifier can signify his desire to furnish additional information about any death, and such facts communicated to the Registrar-General are not entered in the registers, although they are used to improve the accuracy of the official statistics. This has removed any excuse for omitting any part of the facts on the ground that an autopsy report or some other facts about the cause of death are not available when the certificate has to be written

Other recent developments have been the extension of occupational mortality analysis to include the wives, and children up to 2 years of age, of men in various occupations and social classes, and the inquiry at the death registration of married women and widows as to whether any children had been born to them

If we express the standardized death-rates at all ages during the war years in terms of the 1931-35 rates taken as 100, the trend of civilian mortality during the war is seen to have been remarkably good —

	1981–85	1938	1939	1940	1941	1942	1948
Males	100	91	90	107	102	89	90
Females	100	87	87	99	92	80	81

These rates include deaths by enemy action, and they are also prejudiced from 1989 onwards for men, and from 1942 for women, by selective removal of many of the healthiest young adults into the Services Nevertheless, the rates for each sex in 1942 and 1943 were below those of 1988, the best pre-war year, and the improvement compared with the 1931-35 average was about 10 per cent for males and 20 per cent for females.

Children between the ages of 1 and 15 years recorded a remarkable improvement in mortality between 1931-35 and 1939, and this was maintained in 1942 and 1943. The neonatal death-rate fell 10 per cent between 1931-35 and 1938-39, and another 10 per cent by 1943, at 1-12 months also, a 20 per cent improvement has occurred in 10 years —

Ages	1981-85	1988	1989	1940	1941	1942	1948
Under 4 weeks 1—12 months 1-5 years 5-10 years 10-15 years	100	90	90	94	92	87	81
	100	81	73	89	102	77	79
	100	70	58	74	81	52	51
	100	86	68	90	95	69	64
	100	84	78	99	97	74	78

That there is plenty of room for further reduction in infant mortality is evident from the following comparison with other countries in 1940-43:—

INFANT MORTALITY PER 1000 LIVE BIRTHS

	1940	1941	1942	1943
England and Waks	57	60	51	49
Scotland	78	83	69	65
Australian Commonwealth	38	40	39	
Canada	49	51	45	
New Zealand	80	80	29	81
South Africa (Whites)	50	52	48	
United States of America	47	45	40	
Greater London	47	52	46	44
New York City	85	81	29	80

The causes of death responsible for most of the London excess over New York are enteritis and diarrhoza, bronchitis and pneumonia—that is to say, they are infective and therefore should be capable of amelioration.

The decline in death-rates of adult women during the last ten years has been satisfactory at every age-period, ranging from 27 per cent at 35-45 to 17 per cent at 75-85.

It is not possible here to enter into details of the trends of mortality from separate causes. Early in the war a new departure was made by the Registrar-General of England and Wales in order to provide continuous and more up-to-date information on this question. An appendix was added to the Quarterly Returns giving the numbers of deaths for each sex, classified to 36 causes of special interest, in each quarter since the beginning of 1938. With this addition, and the recently initiated table of corrected quarterly notifications according to sex and age (see below), these Returns, and those for Scotland, now provide the most complete records of current vital statistics available in any country, and should be in the hands of everyone interested in the subject

#### MORBIDITY

Statistics of non-fatal illness in Great Britain have lagged far behind mortality statistics in their development. Before the war they were practically confined to figures derived from: (1) Notifications of infectious diseases, (2) National Health Insurance sickness and disability claims in Scotland, (3) School medical inspection, (4) Maternity, child-welfare, and V D clinics, (5) Reports on industrial diseases by H M Inspector of Factories and on mental disorders by the Board of Control, (6) Statistics of admissions to a few large hospitals. Useful as these were, they left us in ignorance of the prevalence of illness in the mass, and of most diseases individually, in the adult population of England and Wales. In 1944 the compilation of national statistics of corrected notifications by sex and age was initiated<sup>3</sup>; but notifiable diseases now account for only a small fraction of adult illness. The Scottish reports on incapacitating illness provided much information about the more serious forms of illness in the insured population, but they had no counterpart in England and Wales. Reports on illness in the Civil Service of Canada on similar lines have appeared during the war.

In the United States of America much useful experimental work has been done over the last 15 years on methods of ascertaining the total illness in the population by house-to-house visitation, on collating doctors' records of cancer patients treated, and on assembling statistics of hospital discharges. In Britain we have been slow to try these methods, but desire for knowledge about the state of health of the civilian population during the disturbances of the present war, anxieties about the rise in sickness claims which had been evident for some years both in Britain and U.S.A., and the awakening interest in "social medicine" led to efforts being made to measure the trends of sickness as distinct from mortality in the adult population

The first requisite was to prepare a classification conveniently coded and designed for the compilation of morbidity statistics, and the publication of the Provisional Classification of Diseases and Injuries by the Medical Research Council' early in 1944 marked an important step forward. This Classification is already in use for compiling statistics of in-patients admitted to all E.M.S hospitals and to some of the municipal hospitals. It has been adopted as the basis of their statistics by the Ministry of Pensions, for sickness recording in factories by the Industrial Health Research Board, by the Nuffield Bureaux of Sickness Records at Oxford and Glasgow, and by other organizations interested in morbidity records. The first series of E.M.S. hospital statistics, relating to admissions during 1942 and the first half of 1943, has been compiled in full detail. When presented in the form of proportionate morbidity-rates they reveal some unsuspected age-trends and contrasts between men and women in the Services 9.10

Another new departure during 1944 has been an experimental inquiry, carried out by the War-time Social Survey on behalf of the Ministry of Health, into the recent health histories of a representative sample of the adult civilian population between the ages of 16 and 65. Different samples of persons, properly distributed according to the region and type of locality in which they lived, and selected at random in those localities, were interviewed in seven different months throughout the year, and their reports as to the illnesses, ailments, and injuries experienced during the 8 months preceding were analysed. Participation in this was voluntary and no record was kept of the identity of those giving the information, which included details of occupation, housing, and other social data. Illnesses were classified according to the duration of incapacity and also into such broad diagnosis groups as were justifiable from self-records, and monthly incidence-rates were calculated. The overlapping

of the 8-month periods covered by successive independent samples made it possible to check the reliability of the sampling method. Preliminary reports on the sickness rates have been published, 9,10 and the experiment is being continued. A satisfactory system of national morbidity statistics can best be evolved by sampling methods in the first instance, and the different experiments now proceeding—in the EMS and municipal hospitals and in the Nuffield Bureaux, by the Industrial Health Research Board, and the War-time Social Survey—are first steps towards this goal

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(See also Morbidity, Measurement of)

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### VITAMINS AND NUTRITION. A E Barnes, MB, FR.CP

Perhaps the most remarkable fact is that, after five years of war, the deficiency diseases (if any) reach our out-patient rooms at a subclinical stage Our problem is to correlate relatively minor lesions of different tissues, usually skin or mucous membranes, with specific deficiencies The reviewer has encountered a few cases of hypoproteinæmia apparently nutritional in origin, but all of them possibly merely 'conditioned deficiency', ie, due not to lack of protem in the food, but possibly in part to mal-absorption. The most interesting contribution to our knowledge of hypoproteinæmia was suggested by J Hartzell et al, who had found that it was associated, along with vitamin C deficiency, with wound disruption They stressed the lack of vitamin C, but Charles Lund, discussing the paper, suggested that lack of protein might be the essential Later S S Altshuler<sup>2</sup> and colleagues showed that intravenous or oral administration of anino-acids raised the blood protein and accelerated the healing of a series of large and chronic ulcers. J H Mulholland,3 with a team of workers, studied bed-sores in a series of patients, including psychiatric ones. They found low protein values, and further that there seemed to be a correlation between the severity of the ulcer and the degree of hypoproteinæmia. They satisfied themselves that it was not a case of the bed-sore draining away the protein, also that a high-calorie-low-protein diet did not assist healing Once they had restored the nitrogen balance by administering an amino-acid-dextrose mixture, the bed-sores began to heal There was conclusive evidence that no known vitamin deficiency was in play. Confirmatory evidence can be found in an article by H T Laycock,4 who describes the horrors of slow starvation He tells of ædema of the legs, genitalia, and, later, the exhibited in China There were no signs of scurvy, face. The legs burst, forming huge ulcers and most cases responded to feeding with almost any available kind of protein. A striking case of nutritional cedema in a vegetarian is described by J. McDonald Holmes. The case responded to a high-protein diet assisted by transfusion of reconstituted plasma, but the patient had a histamine-refractory achierhydria and a posterior gastro-enterostomy, so this was probably partly a conditioned deficiency D S Stevenson's suggests that some of our prisoners of war in Germany, said to have had nephritis, may really have had nutritional ordema, and that the prognosis need not be so guarded as if they had had nephritis It is to be hoped that Pension Boards will not make this assumption without the fullest investigation in the individual cases. The reviewer has recently had a salutary lesson in diagnosing as a nutritional ædema a case of calcified pericardium which responded to operation A C Adamson and D. Lewes<sup>7</sup> give a method of preparing proteolysed beef for use in cases of cœliac disease which might be useful in cases of hypoproteinæmia

Vitamin A.—The clinical estimation of the plasma content of vitamin A, and of the associated carotenoids, is now becoming practicable. Hans Popper and F Steigmans summarize previous work and add their own results. The level of vitamin A is fairly constant, and variations are significant. It is noteworthy that liver disease lowers the level proportionately to the seriousness of the disease. Acute infections such as pneumonia also lower the level and a prognostic value is suggested for the determination. Intestinal diseases lower the level, whilst renal diseases may raise it. In Chicago low levels are more often due to disease than to malnutration. In another article the same authors show that the blood level cannot be raised by intramuscular injections, also that oral administration of carotene usually fails to influence the blood-level to any important degree. So far as the reviewer knows there are no really reliable clinical manifestations of minor degrees of A deficiency.

Vitamin B.—An editorial10 sums up the evidence for and against the importance of a deficiency of B1 as a part cause in the production of cardiac failure in this country, and concludes against it. Its administration does not appear to be of value in ordinary cases of cardiac failure. Overdosage with B, is possible, and may produce symptoms, as noted last year Z A. Leitner<sup>11</sup> has now added a condition resembling anaphylactic snock, and accompanied by eosinophilia. The important question as to whether the capacity for work can be diminished by a low intake of B<sub>1</sub> and B<sub>2</sub> demands very carefully controlled experiments, and Clifford J. Barborka12 et al report such experiments on medical Reduction of B<sub>1</sub> and B<sub>2</sub> to about one-third of normal requirements did produce fatigue, irritability, and increased leg pains during exercise They also found that the relationship of blood pyruvic acid to the total (measured) work increases with the dietetic deficiency, suggesting impaired oxidation. A few days of normal diet restored efficiency. The clinical importance of vitamin B deficiency in reference to mental symptoms associated with oral manifestations is stressed in an illustrated article by A. Grey Clarke and F. Prescott,18 who relate some cases where psychotic symptoms cleared up rapidly under therapy with the B complex [These cases were mostly elderly people, and the reviewer would like to emphasize the importance of treating elderly people (especially such as have recently recovered from a respiratory infection) with large doses of B complex, i.e., aneurin, riboflavin, and nicotinic acid. The position is very unsatisfactory, as hospital beds for observation of these cases are rarely available, many are too ill to move, and there is not enough margin of safety to spend time attempting to analyse the known possible factors (including the possibility of bromism) in such cases —A. E. B | B. Gottlieb14 describes analogous cases which he ascribes to nicotinic acid deficiency, but again the reaction was to polyvalent therapy and not to nicotinic acid alone On the clinical investigation side J. L. Wang and L. J. Harris<sup>15</sup> describe a method of assessing the aneurin status of an individual on similar lines to the accepted saturation test for vitamin C, whilst elsewhere Grace A. Goldsmith16 does the same service in regard to nicotinic acid

In regard to riboflavin  $(B_2)$ , the most important result comes from a large group of workers at the Johns Hopkins Hospital,  $^{17}$  who have demonstrated on a group of adolescents that even when they are kept on a riboflavin-free diet, they continue to excrete the vitamin at a constant level for a period of twelve weeks, whilst the fæcal output was five or six times the intake. This is attributed to bio-synthesis by intestinal bacteria. If this work is confirmed it means that ariboflavinosis is a conditioned deficiency. In his Lumleian

lectures Hugh S Stannus<sup>18</sup> prefers to call the condition hypornboflavinosis, and relates and tabulates some early observations on the pellagra group of diseases He suggests that the deficiency first affects the capillary endothelium. He likewise does not attach much value to circumcorneal injection as a criterion of the condition. In this he is supported by T. K. Lyle, T F Macrae, and P A. Gardiner,19 who describe their standards very carefully and report an examination of 4000 R A.F. personnel, from which they conclude that corneal vascularization is not necessarily evidence of riboflavin deficiency, though there is some, as yet ill-defined, relationship between corneal vascularization and nutritional status J Graham Scott<sup>20</sup> confirms, whilst W J Wellwood Ferguson<sup>21</sup> carefully describes the anatomy and normal standards, and as the result of a survey makes no claim that riboflavin deficiency is the only cause of the corneal condition described From Hong Kong P B Wilkinson and Au King<sup>22</sup> describe an amblyopia probably associated with pellagra a peripheral limitation of the fields, never a central scotoma

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Vitamin C.—The inhabitants of Great Britain are probably more skimped of this vitamin than of any others, yet cases of insufficiency are rarely recorded. R. C. McMillan and J. C. Inglis<sup>28</sup> describe 53 cases of batchelor scurvy They find the cuff test for capillary fragility is unreliable as a test for scurvy They also compare different methods of assessing the deficiency, and a few experiments on their patients showed that the anæmia could be improved by iron combined with other vitamin supplements even in the absence of vitamin C The relationship of vitamin C to bleeding gums was tested in the RAF by W P. Stamm, T F Macrae, and S Yudkin,24 who showed that there was no correlation; hence no justification for expending ascorbic acid on these cases. Some guinea-pig experiments by Ellen McDevitt<sup>25</sup> seem to show some relationship between a low vitamin C level and susceptibility to shock A report on the vitamin C status of patients and personnel at a London Voluntary Hospital (St Thomas's) by F T G Prunty and C C N Vass26 shows that they were largely sub-optimal from May to July but better in September and October. A very high level was reached in one case of anorexia nervosa who lived on salads The past diabetic history was of great importance, and the authors recommend that infective conditions and peptic ulcer cases should receive supplements of vitamin C. One of their patients contracted scurvy by an exact adherence to a diet, and enabled them to determine the latent period of scurvy It was found to coincide very nearly with that of Crandon, viz., 180 days. This suggests that large-scale experiments on volunteers will be prolonged and expensive. Alison Craig, F J W Lewis, and Dorothy Woodman<sup>27</sup> determined the vitamin C status of pregnant women and were able to show that the fœtus acts parasitically, and that the only really satisfactory period of the dietetic year is from August to November. They were, however, unable to correlate any symptoms to the low level of vitamin C intake. Finally, a culmary point C M McKay28 and others discovered that if salads were sliced with a steel knife and chopper and allowed to stand, there is a loss of 90 per cent of the ascorbic acid, whereas if a plastic chopper is used the loss is but 20 per cent in the same time

Are Vitamin Capsules of Value as Supplements to Diet?—There is very little evidence to show that they are, but carefully controlled experiments are being reported and it will soon be possible to get exact data

Cecile Asher28 showed that tablets given to school-children had no effect on weight. J. Yudkın30 did a controlled experiment on school-children and found no effect on height, weight, hæmoglobin, strength of grip, dark adaptation, resting pulse-rate, vital capacity, breath-holding time, or endurance, measured by the R.A.F. mercury test. There was, however, an improvement with vitamin C saturation, a decrease in the incidence and duration of colds, and an improvement in school behaviour as assessed by the teachers. Hilda Fowke, in controlled observations on orphanage children who were by no means too well fed, found that the routine administration of chocolate 'fortified' by vitamins A, B, and C, with calcium and iron, gave no statistically significant result. As will be remembered, American doctors gave to the Ministry of Health large quantities of vitamin capsules for the the benefit of British children. These were used in carefully controlled experiments supervised by E. R. Bransby, J. W. Hunter, H. E. Magee, E. H. M. Milligan, and T. S. Rodgers 32. These are not yet concluded, but a preliminary report shows no significant results except by an endurance test (hanging from a bar) by a small group of children at one place, Glossop. Upon this the authors wish to draw no conclusions at present. A similar experiment which makes no striking claims comes from experiments with vitamins A and C by G. Kohn, E. H. M. Milligan, and J. E. Wilkinson.

School Nutrition.—J V James and J R Marrack<sup>84</sup>, in their group of Hertford-shire school-children, show that free milk has no influence on vitamin C saturation, that vitamin C saturation in autumn has no effect on the condition next spring owing to lack of storage, and good evidence that home dinners have more vitamin C than school dinners owing to the difficulties of mass cooking. It was also found that younger children require more vitamin C for saturation than do older ones, and so do children who have to work (errand boys, etc)

#### ADDENDA

S. Shapiro<sup>35</sup> shows the prothrombinopenia due to the administration of salicylates and aspirin can, in men, be combated by synthetic vitamin K (menadione bisulphate) if given in doses of 1 mg. to each grain of aspirin

A case recorded by Eileen Malone<sup>36</sup> suggests that a combination of pregnancy, obstructive jaundice, and subsequent administration of a fat-free diet may lead to hypoprothrombinæmia and cause gastro-intestinal hæmorrhage

The value of mostimic acid in the prevention of post-anæsthetic vomiting has been 'debunked' by W M Mushin and H M Wood<sup>37</sup> in a properly controlled series of observations

Fluorine is discussed in a well-documented editorial<sup>28</sup> in relation to dental caries, to which it is antagonistic, and its addition to dentifrices is suggested

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#### WAR, PSYCHIATRY OF.

Aubrey Lewis, M.D., FR.CP

In a further report by Col L. G. Rowntree-on the frequency of conditions causing rejection among 18,000,000 recruits examined, he states that 16.2 per cent were rejected for mental disease, 18.9 per cent for mental deficiency (including illiteracy), and 5.1 per cent for neurological disorders. Consequently more than one-third of all rejections are for neuro-psychiatric reasons. Col Rowntree would be disposed to add to this category 'psychosomatic' diseases, such as 'effort syndrome' and peptic ulcer. Because of the high proportion of psychiatric rejections information is now required and provided regarding the medical and social history of the individual, for scrutiny by the medical examiners at the time of recruitment, the forms giving this information are

filled out by social workers, and other data are supplied by the recruit's former school teacher

Comparatively little has been published regarding mental disorders among commissioned officers. A M. Duval² analyses the records of 100 officers admitted consecutively to St Elizabeth's Hospital in Washington during the war, 49 of them were discharged recovered, and 20 improved. Manic-depressive psychosis accounted for about one-third of the patients, and schizophrenia for a like number; 27 of the officers had a history of previous mental illness, for which 10 of them had been treated in a mental hospital. Duval points out that a considerable proportion of the officers in question would have been rejected on entrance to the Service if an adequate psychiatric examination had been carried out.

R. S Schwab<sup>3</sup> has devised a simple graph for rapid determination of the prognosis for return to duty in Service men who exhibit neurotic disability Taking the four variables—amount of stress, amount of breakdown, amount of previous instability, and amount of recovery (each assessed on a four-point scale)—a graph is plotted which gives a general estimate and can be used in the field.

M Levin, who has written frequently on narcolepsy,<sup>4</sup> draws attention to its military aspects. He had examined 25 men<sup>5</sup> who were discovered asleep while on sentry duty, only two of these, it turned out, had narcolepsy. Levin believes that there are other military situations in which this illness might interfere with duty, and he insists that the word narcolepsy should never be used within hearing of the patients, nor should leading questions be asked. For mild cases he would give amphetamine sulphate (benzedrine) 10 to 40 mg daily

The problems that arise in the Pacific are in some respects different from those now familiar on the Western European front M A Zeligs describes the neuroses which developed in a group of previously healthy and stable Americans on a Pacific island base, a coral atoll, frequently under attack by the Japanese. Conversion hysteria was extremely rare, but progressive physical fatigue led to many 'psychosomatic' complaints—e.g, dizziness, anorexia, headache Accidents became more frequent. The men who had conspicuous anxiety needed to be removed from the combat area if they were to improve. Zeligs draws the conclusion that periods of duty should not be long in isolated areas such as this where there are few recreational facilities, no opportunity for leave, and small chance to retaliate on the enemy. Men who break down should be evacuated promptly to a secure area.

A. Torrie? has analysed 2500 psychiatric casualties seen in the Middle East during 1942. One-third of them had anxiety as their most prominent symptom; one-quarter were diagnosed as having hysteria, and the next commonest diagnosis was psychopathic personality, which was found in one-tenth. Among 1000 patients with anxiety neurosis or hysteria, 58 per cent were returned to full duty and 31 per cent to Base duty; 5 per cent were invalided. Further details about Service psychiatry in the Middle East are given by H. B. Craigne.

J F Burdon has observed instances of "foreign service neurosis" in sailors who have been absent in the tropics during the war for long periods. He believes that two years' absence, or at most three years', under such conditions will be enough to produce marked results in previously normal people. He does not consider that the type of rehabilitation which has been advocated in some quarters for prisoners of war should be employed for these sailors, who improve quickly at home without special treatment.

L. A. Nichols<sup>10</sup> was able to study native African troops with neurotic disabilities. He considered that military training and routine had increased their

already great suggestibility and proneness to hysteria. He stresses the necessity for evaluating their symptoms in relation to their normal beliefs before diagnosing or treating these patients, whose mental condition responds readily to kindliness and suggestion

D. Curran and G Garmany<sup>11</sup> hold that psychiatric casualties attributable to operational stress occur most commonly after rather than during the time the stress operates. Among sailors the psychiatric sickness-rate is very much greater ashore than affoat, the authors point out that this discrepancy cannot be accounted for by accumulation of neurotics in naval depots ashore

In his out-patient work at a large naval depot, G Garmany<sup>12</sup> has studied 1842 cases of anxiety brought about by sustained and often exceptional stress, 1171 of these men were returned to full combatant duties, and Garmany believes that institutional treatment for them is to be avoided "The best occupational therapy for these cases lies in full duty and Service surroundings"

D W Hastings, B C Glueck, and D G Wright<sup>13</sup> have treated fatigue and emotional illness developing in combat are crews with sodium amytal narcosis. The patients were men of stable personality who had been exposed to great stress repeatedly. The narcosis was not instituted until after careful physical and psychiatric examination. Sufficient amytal was given to keep the patient soundly sleeping for 20 hours in each 24. In mild cases the narcosis would be terminated after 36 or 48 hours; it was never allowed to go on for longer than 96 hours. A drop in systolic blood-pressure below 80 and dilatation of the pupils with a reversal of the light reflex, were taken as danger signals, administration of 100 per cent oxygen by mask for 5 to 10 minutes proved effective when the respiratory centre had become affected by the amytal, 70 per cent of the patients were returned to full combat duty after this treatment and about a week of further rehabilitation.

Hyperventilation is now a well-recognized syndrome, though it is unclear why it should occur more frequently in emotionally unstable persons R. F. Rushmer and D D Bond, if following the earlier report by H. C Hinshaw, is have collected 16 cases in which it developed in pilots during flight; it would also come on during a test in a device for producing motion sickness. It proved to be often an indication of emotional maladjustment, and all but one of the men studied had to give up flying for reasons not directly concerned with their hyperventilation syndrome. If, however, the patient has previously been emotionally stable, simple explanation of how the symptoms are produced could be effective in preventing their recurrence

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#### WAR SURGERY.

Lambert Rogers, M Sc., F.R CS

References to various aspects of war surgery will be found elsewhere in this issue, e.g., in the articles on gas gangrene, pain after amputation, the scalenus syndrome, and even on ingrowing toe-nail, which is at times a problem in marching troops. Indeed, few aspects of surgery have been unaffected by the war years. What follows, therefore, comprises merely a few items which are perhaps rather more directly connected with gunshot injuries and the battlefield itself.

War Wounds and Pencillin.—This was referred to in some detail in last year's MEDICAL ANNUAL (pp 59, 141, 362) Pencillin's early promise has largely been fulfilled. Due to its limited production, its use was at first restricted to Service patients and those injured in air raids, i.e., to war casualties generally, but recently, production having been greatly increased, it is now

readily available for all categories of patient likely to derive benefit from it. Remarkable results have been seen in some cases, e.g., recovery in meningoencephalitis with cavernous sinus thrombosis.

It should be remembered that like the sulphonamides, penicillin is bacteriostatic, not bacteriocidal, ie, it inhibits growth of the organisms but does not produce their rapid death. Its effect may therefore not be apparent for some time, perhaps even days or weeks. Frequent or continuous administration is necessary because of its high solubility and rapid absorption and elimination by the kidneys. Its potency can be diminished by heat and oxidizing agents, hence it needs to be stored in air-tight containers and kept in a refrigerator. It is destroyed by acids and alkalis so that oral administration



Fig. 61.—Radiograph showing a complete cartridge with wooden bullet placed between a patient's leg and the film

The arrow points to the bullet, which is practically invisible.

(By kind permission of the 'British Medical Journal')

is ineffective; it is therefore either introduced directly into wounds and abscess cavities, or given systemically, intramuscularly, intravenously, or intrathecally. It has been introduced directly into the cerebral ventricles.

One slight disadvantage is the irritant character of certain minute amounts of impurity which occur along with it in the form in which it is at present available. Pure penicillin is apparently non-irritant and non-toxic, but the impurities which are associated with available sources may irritate the tissues, and, when it is administered intravenously, lead to thrombosis. Peter Martin, writing from a Naval Hospital, has to a large extent got over this difficulty by adding small quantities of heparin, which is without effect on the penicillin. He advises 3 units of heparin per c.c of penicillin in the intravenous drip, an amount which, if the infusion is given at a rate of 35 drops per minute, is insufficient to affect the clotting time of the recipient's blood.

A valuable account of the use of penicillin in war surgery appeared in the Penicillin Number of the British Journal of Surgery,<sup>2</sup> an extra issue of that journal devoted entirely to the subject and additional to the usual four annual numbers. (See also Penicillin.)

Needle Punctures.—The wounded these days are given so many subcutaneous, intramuscular, or intravenous injections (morphine, anti-gas, anti-tetanic serum, penicillin, etc.) that it is not altogether surprising that numbers of those back from the landings in France were 'needle shy', and some complained more of the injections than of their wounds. Continuous drips are therefore to be preferred to repeated injections, and the value of heparin in maintaining such drips (see above) is worthy of note

Wooden Bullets.—It has been reported that wooden bullets have been used by the German Army on some battlefields. They are said to be effective over comparatively short distances, such as a range of one hundred yards. N. P. Henderson³ points this out and the fact that such bullets are, of course, not visible in X-ray films (Fig. 61). Major H. B. C. Pollard,⁴ commenting on the report of the use of wooden bullets, describes "the whole business as a soldier's story" and states that wooden "bulleted blanks" are used on the Continent in machine-guns where back gas pressure is needed for the mechanism of the gun. He states, however, that all German and Italian wooden bullets break up at the muzzle of a rifle and will not penetrate a cardboard screen at six feet. Replying to this L. H. Taylor⁵ reports at second hand a fatal case of an abdominal wound with one of these bullets at 5 to 10 yards. [The reviewer has not come across any cases of wounding by wooden bullets]

#### WAR SURGERY ON THE CONTINENT

Last year (Medical Annual, p 860) reference was made to such reports as were available of surgical practice in the German Forces. No striking innovations have come to notice since, but certain papers appear to be worthy of comment. The Bulletins of War Medicane (published by the Medical Research Council) have provided certain of the material which follows:—

Wound Infection.—B Karıtsky<sup>6</sup> states that wound infection is the first and most important of the problems of war surgery and the primary task of the military surgeon is its prevention. Through-and-through wounds by smooth missiles are comparatively clean and usually heal by first intention. All wounds by rough missiles (grenade, bomb, or mine fragments) must be regarded as infected. In the first 12 hours following receipt of the wound the whole wound area may be excised "like a sac", a procedure which he claims as Friedrich's method, but wounds of longer duration should be treated by what he calls von Bergmann's method—opening up the wound and all its recesses, removal of all dead tissue and foreign materials, drainage and counter-drainage. Primary suture is condemned except in the case of joint capsules and large body cavities. He comments on the dreadful state of the wounded on the Russian front compared with those in France in the early days of the war. The affects of cold, physical and mental strain, and shortage of food were very apparent in the cases from Russia

Air Transport.—The importance of air transport of wounded has been well brought out in this war and its great advantages are daily being realized. Writing on his experiences as a surgeon in a Luftwaffe unit, K. H. Wilcker states that air transport was used for 15 per cent of all casualties. Among 6000 of these casualties, amputations of limbs were performed in 36, mostly by the circular method. No deaths occurred among 9 cases of gas gangrene, and this was attributed to the early and free administrations of anti-gas-gangrene

serum. Among the wounded seen by Wilcke there were two fatal cases of tetanus, one following burns

Retained Missiles.—It has been found that fragments of shells, mines, grenades, and bombs are more frequently retained in the body than rifle or machine-gun bullets. H J Laubers comments on this, and discusses the factors responsible, such as velocity, shape, mass, etc Extraction of the missile is advisable at the initial wound treatment, but prolonged search and dissection should not be carried out Fragments deeply situated in the brain or lung are better left alone at first, but may require removal later Administration of antitetanic serum before late operations is important. Infection may be remarkably latent, and gas gangrene around a retained fragment in the thigh has occurred without obvious cause 18 years after wounding

Buttock Wounds and Gas Gangrene.—H. Brandt<sup>9</sup> states that all buttock wounds should be treated as if gas gangrene were already present. His paper is based on a series of wounds produced by rough missiles, and he comments on the relatively high incidence of gas infection in wounds of the buttocks as compared with those produced elsewhere in the body. The diagnosis of gas infection in these wounds is not always evident, but should be suspected when pain is a prominent feature associated with deterioration in the general condition of the patient. Opening up of the wound widely is indicated, and the removal of infected tissues and retained missiles. Hydrogen peroxide is favoured locally with anti-gas gangrene serum intravenously. Sulphonamides are also advised and blood transfusion if indicated.

K. Kaeselitz, 10 believing that the severity of gas infection is aggravated by blood loss at the time of wounding, and that its spread locally is favoured by ischainia, such, for example, as that which results from the ligature of a main vessel, recommends blood transfusion in addition to saline infusion, anti-gas gangiene scrum, and radical surgical measures

Gunshot Wounds of the Knee.—In a Russian paper M O. Fridland<sup>11</sup> classifies wounds of the knee into 2 groups (1) penetrating injuries, (2) periarticular injuries. In the periarticular group, joint infection may develop late from spread of infection along fracture planes In early cases of knee-joint injury, completely detached cartilage or bone fragments are removed, and if destruction of bone and cartilage has been considerable, primary resection of the The writer does not hesitate to introduce sulphonamide joint is advocated powder or spirit into the joint cavity. For neglected cases of joint infection radical treatment is indicated, and he discusses the alternatives of secondary The indications for secondary resection are: (1) resection or amputation Superficial osteomyelitis of the articular ends of the bones when the distance between them after such resection will not be more than 5 or 6 cm, (2) The general condition of the patient is satisfactory After the resection the wound is left partially open and packed A plaster spica is applied for 8 or 4 months with a window over the wound In advanced cases of bone and joint infection amputation may be required as a life-saving measure

A German surgeon, E Plaas, 12 writing on the same problem, namely, suppuration in the knee-joint following gunshot fractures, advocates anterior and posterior drainage of the joint, rather than resection. He gives the indications for amputation as infection spreading outside the joint, secondary hæmorrhage, deterioration in the patient's general condition, and failure to control local infection.

Cansalgia after War Wounds.—Wanke<sup>13</sup> reports 6 cases, 4 patients had nerve lesions, one an amputation stump, and one a wound of the dorsum of the foot. Emotion, noise, or contact with rough or dry objects, elicited or increased the

pain; hygromania was marked, i.e., the patient not only wishing to keep the affected limb but also other parts of the body wet. Exo- or endo-neurolysis proved useless, but sympathetic nerve resection was successful in one case of sciatica nerve involvement and partly successful in two other patients with brachial plexus lesions (See also Amputations, Pain After.)

Dangers of Intrathecal Sulphonamide.—G Elsasser<sup>14</sup> reports 3 cases of lesions of the cauda equina following the injection of sulphapyridine by lumbar puncture. The cases occurred in men aged respectively 22, 33, and 22. In two of them the sphincters were involved as well as the leg muscles. Recovery was only partial in all 3 cases. The intrathecal injection of sulphapyridine is condemned as dangerous; it has no advantages over oral or intravenous administration, since by either of these routes it reaches the central nervous system.

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WAR SURGERY IN HOSTILE COUNTRIES. A Rendle Short, M D., F.R.C S. Little, if any, information has been published in this country as to the methods of treatment used by the Japanese, but a considerable number of German papers have been abstracted in various issues of the Bulletin of War Medicine. There is, however, not much to be learned from them. In general, the methods followed seem to resemble those used by British and American surgeons The sulphonamide most in favour is marfamil or mesudin, which retains its activity in the presence of pus. It is active against the Clostridia of gas gangrene, and works better when used locally than when given by mouth. Penicilin appears to be unknown Treatment of abdominal, thoracic, and cerebral injuries runs on familiar lines. Fractured femur is treated by internal fixation with the Kuntscher nail, which is made of steel, is threeflanged, and is driven down the medullary cavity through the great trochanter. It is claimed that the patient can walk in three weeks. German surgeons appear to make much less use of blood transfusion than the Allies Sympathectomy has been recommended for frost-bite, but not in the early stages Very little has been published on the treatment of burns, benzocain seems to be a favourite dressing

WATERHOUSE-FRIDERICHSEN SYNDROME. (See ADRENAL GLANDS)

WHOOPING-COUGH. (See Pertussis)

YELLOW FEVER CONTROL. (See also Malaria and Yellow Fever-Species Eradication.)

Major-General L T Poole, D.S.O., M.C., M.B., D.P.H., K.H.P.
Major J W Howre, M.D., R.A.M.C.

During the past four years certain modifications have been made in the recommendations for yellow fever control, and the purpose of this article is to mention these changes and to discuss briefly the evidence brought forward in support of them. The subject is dealt with under the following headings: Administration, General considerations, Immunization; Aëdes control; Surveys to detect the evidence of the disease, Early recognition of the infection.

#### ADMINISTRATION

Air travel on a large and growing scale has increased the risks of spreading some diseases to parts of the world that were formerly free from them. In

this connexion, the international importance of yellow fever control was fully appreciated, and the Office internationale d'Hygiène publique in Paris was given powers to frame all necessary regulations. When France fell in 1940 this international control ceased, but in 1941 an Interdepartmental Committee was set up in London under the auspices of the Colonial Office to deal with British needs as they affected the Colonies, Dominions, Territorics under control of the British Foreign Office, and India

This body, formed at a time of great stress and danger, did good work, and its authority grew. Although the recommendations in its Interim Reports¹ were made solely to meet our own needs, they received acceptance from all interested parties, including India, which, as we shall see, is specially concerned in effective control of yellow fever—Since 1941 the picture has changed, America has entered the war and the liberation of Europe is well advanced, so that it is once more possible and necessary to regard yellow fever control as part of a wider international problem to be dealt with under International Sanitary Conventions—These are now under review by UNRRA. (United Nations Relief and Rehabilitation Administration), but until that body has assumed full responsibility for their operation, the recommendations of the Interdepartmental Committee will remain in force

#### GENERAL CONSIDERATIONS

The control of yellow fever is complicated because there are gaps in our knowledge of the life-history of the causative agent and because we do not know what combination of factors is needed before the disease can become perman-Theoretically, the principal factors necessary ently established in any land for the continuance of the disease are the presence of the virus, suitable climatic and environmental conditions, a vector, and a susceptible host, human or If any of these links is missing, the disease cannot spread, thus, single measures of prevention may suffice for strictly localized places, such as seaports and airports, but for the greater issue of general prevention of yellow fever all the factors that we assume to be associated with its spread must be taken into consideration. To achieve success, the measures adopted must be applied with intelligent understanding and form an integral part of an efficient public health service that must have legal powers to enforce regula-Whatever measures are adopted, they must never lack continuity despite silent periods of the disease

Although yellow fever was recorded in America about 130 years before its recognition in Africa, some believe that the home of this infection was West Africa, and that in the days of the slave traffic the disease was conveyed by these unfortunate people to the New World, packed sailing ships, with their open water-tanks in which mosquitoes could breed, offered all essentials for spread of the disease. If this hypothesis is true it is difficult to understand why, throughout the era of sailing ships, the virus should not have been conveyed to the Continent of India, where, in the light of our present knowledge, conditions would appear to be equally ideal for its spread. It is remarkable that the disease has remained localized to Africa and America, and difficult to explain, since the geographical distribution of the infecting agent does not correspond with that of the common vector, Aedes ægypti Equally interesting is the fact that A. agypti is also responsible for conveying dengue fevera disease spread in much the same way as yellow fever-and that dengue is endemic in the three continents, whereas yellow fever is found in only two of them. Nevertheless, until our knowledge is more advanced, it is incumbent on us to take every precaution to prevent the spread of yellow fever to what would appear to be areas where the disease could flourish. Thus, we have especially to protect the Orient as a whole and India in particular, with its vast susceptible population, for it would indeed be a calamity of great magnitude if yellow fever spread to the East

#### IMMUNIZATION

One of the most important single measures of prevention is active immunization with a virus vaccine, in war-time this is perhaps the most important measure of all

Development of Protection.—The Interdepartmental Committee, in their Third Interim Report, adopted the view that persons inoculated for the first time could be regarded as having protection on and after the tenth day following the injection, but recommended that they should be subject to quarantine for six further days—the incubation period of the disease—if they were exposed to infection before the tenth day. This recommendation had the effect of prolonging the period of quarantine up to a maximum of fifteen days, but it has now been amended to a flat rate of ten days irrespective of whether there has been exposure to infection or not. This amendment has been based on the work of M Theiler and H H Smith,2 whose findings have been confirmed by other workers These investigators found that immunity following inoculation precedes the development of demonstrable antibodies Thus, if rhesus monkeys are inoculated with 17D vaccine virus and tested at various intervals afterwards by injections of virulent (Asibi) virus in an amount corresponding to several M.L.D for mice, they survive the test injection if this is given seven days, or later, following inoculation After the seventh day circulating virus is not demonstrable because the presence of circulating virus is incompatible with the presence of antibodies Although circulating antibodies are thus assumed to be present from about the seventh day, they are not in sufficient amount until the fourteenth day for their demonstration by protection tests.

The results obtained in rhesus monkey experiments have been accepted by the Interdepartmental Committee as applicable to man. Their recommendation, therefore, is that persons vaccinated subcutaneously against yellow fever with a satisfactory vaccine should be regarded as immune to infection with yellow fever ten days or more after the vaccination. This gives a period of three days' grace as a precautionary measure. If the results obtained in monkey experiments hold good for man, and there is reason to suppose they do, there would appear to be no necessity for extending the period beyond ten days before yellow fever certificates of inoculation are accepted as valid-evidence of protection.

Duration of Immunity following Yellow Fever Inoculation. -In 1941 the Interdepartmental Committee recommended, in the light of the knowledge then available, that two years was the maximum period of full protection afforded by inoculation Following this recommendation, published findings in America showed that vaccination of an adult population with a virus of established antigenicity resulted in the persistence of an immune state which was satisfactory, from the group standpoint, for at least four years and probably much longer, since the rate of continued decline was very small Workers at the Entebbe Yellow Fever Research Institute in Africa, studying the same problem, but with a population immunized for a shorter period of time, found that more than 90 per cent of those they examined showed adequate immunity thirty months after inoculation As a result, they share the American view that the period of immunity can safely be extended beyond two years groups chiefly composed of adults, J P. Fox and A S Cabral<sup>2</sup> studied the duration of yellow fever immunity following vaccination with several substrains of living 17D virus, and found that only 2 per cent of sera collected four years after vaccination failed to show some indication of protective action Fox has continued the investigations and we understand that he has examined 75 sera six years after vaccination and found that 78 per cent showed some evidence of immunity

J C Bugher and A Gast-Galvis have studied the efficacy of vaccination in the prevention of yellow fever in Colombia, and conclude that effective immunity from vaccination with 17D virus is obtained for at least four years. In the groups observed they found no clinical evidence of a break-through in protection at the end of a four-year period, and they think it highly probable that immunity continues for a much longer time. An important point in their observations was that yellow fever continued among a small unimmunized fraction in an endemic area but not among the immunized

Therefore, from the observations that have been made, the evidence is sufficiently strong to warrant an extension of duration of immunity following inoculation from 2 to 4 years, and this recommendation has been made by the Interdepartmental Committee

One point, however, has not yet been settled. According to Fox and ('abral's children do not develop as high or as lasting an immunity as adults, and particularly low levels are found in children under 10 years of age. Smith (unpublished), on the other hand, studied the records of yellow fever immunization in Colombia and found no appreciable difference between the original response to vaccination of children around the ages of 7 and 8 years and that of adults. In view of these divergent findings it is clear that more work will require to be carried out in this connexion. At present this is hardly a war-time problem, and is not considered of sufficient moment to warrant any other than a general recommendation that inoculation affords protection for four years.

Vaccine Standard.—As with all immunizing procedures the problem of conferring artificial immunity is bound up with the efficacy of the antigen This is more particularly the case when the antigen used is a living virus, for if it is not alive on inoculation it cannot multiply within the body and will not confer the desired protection. The vaccine may be fully potent when it leaves the manufacturing laboratory, but unsatisfactory results cannot but fail to occur if, after this, it is improperly handled and stored before assessing results of mass immunization, it is necessary to have a standard that those responsible for the preparation of the vaccine must agree to fulfil This standard must ensure, as far as possible, successful immunization with a minimum of risk to health of persons inoculated, safeguards must also be introduced to ensure that the vaccine is properly handled and administered, and that protective tests are carried out periodically on inoculated persons to prove the efficacy of the procedures involved This is particularly indicated now that a number of laboratories may possibly undertake the manufacture of vaccine as a commercial proposition, since there is likely to be a demand by persons wishing to comply with the regulations of air travel which require possession of certificates of yellow fever inoculation Up to date yellow fever vaccine has not been purchasable in the open market, and thus its manufacture has not come under any regulations governing the sale of therapeutic substances Consequently, no specifications had been laid down for its manufacture by any agreed authority, and accepted by all concerned. The Interdepartmental Committee has now made such a recommendation, but the first attempt to define standards precisely was made by M V Hargett, H W Burruss, and A. Donovan 5

The International Health Division Laboratories of the Rockefeller Institute issue a vaccine manufactured from a single dried seed-virus preparation of strain 17D, an adequate quantity of which will be available for a long period

of time This has been done to avoid fluctuations in antigenicity. The same procedure is adopted at the Wellcome Bureau of Scientific Research, London, the United States Public Health Service Laboratory, Montana, and in the laboratories at Rio de Janeiro, Brazil, Bogota, and Colombia, that are maintained jointly by the governments of the respective countries and the Rockefeller Foundation. All these laboratories follow the technique of preparation employed in the International Health Division Laboratories in New York. Vaccine used in the French African Empire is prepared by a different technique

There is no indication that yellow fever vaccine prepared by any one method affords greater protection against attack than that prepared by any other, the main criterion is safety from untoward systemic reactions

The 17D strain of virus has been chosen because its virulence is such that no dangerous or severe reactions are produced among the inoculated. It has low viscerotropic and neurotropic properties, and it has been tried out on a large scale over a period of years. But since the virulence of the 17D strain of vaccine virus has shown variation while being maintained in the laboratory, it is carefully tested at frequent intervals to determine if there has been any increase in viscerotropism or neurotropism, and the seed-virus under examination is discarded if it shows changes

The active virus content of the vaccine is no less important, and the International Health Division Laboratories assay this in terms of M L D for mice. J. P Fox, S Kossobudzki, and F da Cunha, on the other hand, assay the vaccine in terms of minimum immunizing doses for mice, and have come to the conclusion that, in order to immunize a satisfactory percentage of persons, the routine vaccine dose should contain not less than approximately 500 minimum immunizing doses for mice. This corresponds closely to the dose recommended in terms of M L D, and workers are now generally agreed that each vaccinated person should receive an amount of vaccine equivalent to at least 500 M L.ID for mice. To determine its content of active virus, the vaccine is tested by the intracerebral inoculation of serial tenfold dilutions into mice, not more than 42 days old and of known susceptibility.

To preserve virus activity the vaccine is dried so that it contains no more than I per cent moisture. But efficient desiccation is only one factor in the preservation of virus activity, storage and technique of administration are of equal importance. It is absolutely essential to store the vaccine under refrigeration at about 4° C. or lower, not only in the laboratory but also during transit up to the time of use. In reconstituting the dried vaccine one must ensure that the sterile physiological saline, syringe, and needle are all at a temperature of 37° C or less. If the vaccine is subjected to high temperature, the activity of the virus will quickly deteriorate. Reconstituted vaccine must be kept in a cool shaded place, but no matter what precautions are taken, the reconstituted vaccine deteriorates rapidly, and if not used within an hour it must be discarded. Chemicals also rapidly kill the virus, therefore, no spirit or antiseptic of any kind must be allowed to contaminate the syringe or needle

Reactions are negligible following administration of yellow fever vaccine as now prepared in America and England, nevertheless, as with all vaccines, certain precautions must be taken. Adrenaline should be at hand ready for injection against the remote possibility of a severe reaction from sensitization, and the inoculated person should remain under observation for 30 minutes. Not uncommonly a person will attend for vaccination having indulged freely in alcohol the night before, or he may indulge freely after inoculation. This point has received consideration because of the joint effect which the virus and alcohol may have on the liver. While there is no scientific evidence to indicate that the taking of alcohol immediately before or immediately after

yellow fever inoculation has a deleterious effect, it is certainly desirable that persons should not take alcohol for a period of twenty-four hours before and after inoculation

As early as 1934 post-vaccinal jaundice was observed to follow inoculation with yellow fever vaccine on some occasions 7 G M Findlay et al 7, 8, 9 demonstrated that the icterogenic agent was unrelated to the strain of yellow fever virus employed, and that it was present in the human serum used as a diluent in the preparation of the vaccine Despite these observations, when the 17D strain of vaccine virus was first introduced in 1937, it was diluted with human This preparation was distributed between the years of 1937-39 in South America to immunize one and a half million people and no cases of jaundice were observed Thus, it was concluded that this preparation was non-icterogenic and could be safely used to inoculate American and British troops But in 1942 the Secretary of State in Washington reported that 28,585 cases of jaundice had developed between January and July, 1942, among United States personnel following inoculation of this vaccine There were 62 deaths, giving a mortality-rate of 1 in 461 cases—a death-rate approximately double that which occurred during the same period from infective hepatitis among the troops in the battle areas Later, among British troops inoculated with vaccine prepared in England, a similar outbreak of jaundice was noted, though much smaller numbers were involved

In 1940 an alteration was made in the method of preparation of the vaccine in South America so as to exclude the use of human serum, and no cases of jaundice have been observed following inoculation of this preparation. While it cannot be concluded from the South American experience that the exclusion of human serum will obviate the occurrence of jaundice merely because it has not been observed following the two vaccines used there, there is every indication that this complication has in fact been overcome, since no cases of jaundice have been reported as attributable to the vaccine amongst the British and American forces following inoculation with the present preparation, which consists of an embryo extract diluted with distilled water

#### Aëdes Control

Ardes ægypti (Stegomyna fasciata) is the common invertebrate vector of yellow fever, and, as this mosquito is invariably associated with urban outbreaks, it may be well to recall briefly its habits in so far as they have a bearing on the transmission of the disease A ægypti is a true domestic insect that is seldom found far from human habitation From houses situated in the close vicinity of airports, the insect can wander into the aeroplanes, similarly, it will enter ships when they are moored in harbours, and in such places it is found resting in dark corners when not feeding. It bites mostly by day, especially during the afternoon, and it has been called the "Tiger" mosquito The female can live a long time without a blood meal, surviving in nature for something like six months When she sucks the blood of a person suffering from yellow fever during the first three days of the illness, the female mosquito picks up virus But, under natural conditions, before she can transmit the infection, a period must clapse during which time the virus multiplies and spreads throughout her body, and it is usually about twelve days before she is capable of transmitting the disease. But once infective she remains so for the rest of her life After the blood meal she lays her eggs They are laid singly and in cunningly selected sites. Although the eggs are laid singly, the grand total may amount The fertilized eggs are resistant to the external influences to a hundred or more that are likely to be met with where they are laid, as a result, they can remain dormant for months before larvæ hatch out in odd collections of water such as in buckets, old tins, and all the other odds and ends that are usually found in the vicinity of native dwellings. The larvæ can remain below the surface of water for long periods—a point of importance

Although several species of mosquito have been shown to be vectors of the disease, A agypt is unquestionably the most important. Therefore, the term "Aëdes Control" implies control of the species agypt, and the term "Aëdes Index" means the proportion of dwellings examined in which the larvæ of .1. agypt are found—a dwelling being any habitation occupied by a single family. The actual figure for the "Aêdes Index" that can be accepted as showing "Aëdes Control" has been the subject of much controversy. The ideal, of course, is nil, but (short of complete extinction) the important point is that, whatever figure is decided, it must remain constant throughout the whole year. Some authorities maintain that the figure should not exceed 1 per cent, while others hold that it should not be greater at any time than 0.4 per cent. To achieve a satisfactory index, it is obviously essential that continuity of effort must be maintained by a permanent staff trained in this work

The problem of the control of jungle yellow fever is much more difficult, because our knowledge of this form of the disease is far from complete. Recent work (Rockefeller Foundation Review for 1941) explains how the infection may be carried over from one wet season to another, but jungle vellow fever is outside the scope of this article

#### SURVEYS TO DETECT THE EVIDENCE OF THE DISEASI.

Surveys to detect evidence of yellow fever are a most important measure of prevention, the surest means of survey, especially in remote parts of endemic areas, is the collection of specimens of liver tissue for the examination of specific histological changes from all persons who die of an undiagnosed febrile disease within ten days of its onset. This is best achieved by a viscerotomy service as described by F. L. Soper, E. R. Rickard, and P. J. Crawford 10

Antibodies that develop in the serum of persons and certain animals after infection constitute evidence of the disease. Detection of antibodies is carried out in animal protection tests by employing the standard intraperitoneal test in adult Swiss mice of from 35 to 49 days old as developed by W. A Sawyer and W Lloyd <sup>11</sup> In this test, intraperitoneal inoculation of virulent French neurotropic virus and serum to be examined for antibodies is followed by cerebral traumatization that causes virus not neutralized by the serum to localize in the brain. More recently, L. Whitman<sup>12</sup> has introduced the "young mouse test", which is an intraperitoneal protection test without cerebral traumatization, utilizing mice of ages from 17 to 21 days. Because these young mice are much more susceptible than older animals, cerebral traumatization as an aid to virus localization in the brain is unnecessary as in the standard test. The "young mouse test" is a delicate one and its general applicability has yet to be determined.

Mouse protection tests are of very great value, but due care must be taken in their interpretation. A. F. Mahaffy, W. Lloyd, and H. A. Penna<sup>15</sup> have recommended standards that should be followed in interpreting results. W. A. Sawyer<sup>14</sup> carried out a series of protection tests on the sera of several persons who had suffered from yellow fever many years previously. His results indicate a lifelong persistence of antibodies in the serum of most persons after an attack of the natural disease. The mouse protection test is unquestionably specific in the strict sense of the word. But, as with other specific biological tests, non-specific reactions sometimes occur from a variety of reasons. W. Sawyer, J. H. Bauer, and L. Whitman<sup>15</sup> had 2 inexplicable positives among 876 specimens from Asia and Australia, and 1 positive reaction in 480 sera from Italy

Rarely, a person whose blood neutralizes virus in repeated tests has been found even in India, where exposure is hardly feasible. Thus, a single positive mouse protection test alone cannot be accepted as defining a yellow fever area, and it is important that this should be borne in mind. A region should be classed as endemic, for purposes of control regulations, only after an adequate number of positive tests has been revealed, and only if evidence has been brought to show that exposure to infection could actually take place For example, if the vector is eliminated by mosquito control from localized regions, such as seaports, there would appear to be no reason why such places should be classed The specificity of protection tests is adequate, but it still requires as endemic careful consideration how far they should be accepted as a basis for determining endemic areas, and what the definition of an endemic area should be be noted that mouse protection tests with the sera of young children have special value in showing whether yellow fever has been present in an area within recent years

As with man, the mouse protection test with monkeys appears to be equally specific. It has long been known, however, that there are non-specific substances, capable of neutralizing yellow fever virus, in the sera of certain animals, particularly goats and other ruminants, which have never been exposed to yellow fever. But this observation should not detract from the value of the test in detecting past infection in man and monkeys

Evidence indicates that the virus may be harboured in various animals, and work is in progress to determine what vertebrates and invertebrates are capable of acting as hosts. G. M. Findlay and T. A. Cockburn, 18 in West Africa, have detected yellow fever immune bodies in the serum of one of five rodents called Thryonomys swinderianus, in one of four buff-backed herons, in one of three African barn-owls, and in the only Senegal kingfisher they examined some of these birds have an extensive migratory range, and these findings are worthy of note. T. P. Hughes 17 found high concentrations of circulating virus in certain individuals among the African grivet monkeys, Cercopithecus athoops centralis. Neuman, following the bite of infected mosquitoes. In the past there have been occasional reports of the death of large numbers of monkeys just before an outbreak of yellow fever. But what part the monkey plays in maintaining the disease has yet to be determined.

#### EARLY RECOGNITION OF INFECTION

Early clinical diagnosis of the disease is an important measure in prevention. Unfortunately, it is seldom made with any degree of accuracy except in the severe cases, and in these only during an epidemic. Clinical diagnosis is based on an acute fever with sudden onset, a rapidly developing albuminum that may increase within the first two or three days to such an extent that the urine may almost clot on boiling, extreme prostration out of all proportion to the temperature or general condition of the patient, Faget's sign, haemorrhages in mucous membranes appearing about the fourth or fifth day, and jaundice. Although the disease is called yellow fever, the jaundice may not be marked even in severe cases. During the actual fever the patient is nursed in a screened ward or under a mosquito net because the virus is present in the blood-stream during the first three to five days of the fever, and it is important to prevent infection of mosquitoes from this source.

Mild cases of yellow fever are not easily differentiated from other febrile conditions. If the disease is suspected, the laboratory can be of assistance, but the necessary tests require time. Three laboratory diagnostic methods are available identification of virus in the blood, demonstration of immune bodies by the mouse protection test, and recognition of specific histological

changes in the livers of fatal cases Blood taken during the first three to five days of fever may be packed on ice and sent quickly to an appropriate central laboratory where virus can be identified by inoculating mice intracerebrally and showing that the infective agent is neutralized by known protective sera Identification of virus in this way is, of course, complete evidence that yellow fever is present. For the mouse protection test two samples of serum are required one taken at the very earliest stage of the fever, and the other towards the end of the third week during convalescence. If protective antibodies are found in the second sample but not in the first, or if a rise in titre has occurred. the result is positive Deaths from yellow fever usually occur before the tenth day, therefore, in an endemic area it is a wise precaution to examine for specific histological changes a specimen of liver tissue from any who die of an undiagnosed febrile disease within ten days of its onset Specimens are easily obtained by means of a viscerotome if there is any obstacle to carrying out a post-mortem

As soon as the existence of yellow fever is proved in a given locality, all unprotected persons should be vaccinated. The vaccine is our most powerful single means of preventing spread. As already explained, protection is acquired rapidly—about seven days after inoculation. This leaves a margin, because, after a mosquito sucks infected blood, twelve days must usually elapse before the insect can transmit the disease. Therefore, if inoculation is carried out without delay, the disease should be stamped out almost immediately. But the apparent simplicity of controlling yellow fever with a single measure of prevention should be set against the difficulties of rapid mass vaccination. Many details are involved and much organization is necessary, for the task of discovering and inoculating all at risk may indeed be immense

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#### THE PRACTITIONERS' INDEX.

## RECENT PHARMACEUTICAL AND DIETETIC PREPARATIONS, MEDICAL AND SURGICAL APPLICANCES, ETC.

In this Section we give short descriptions of the new Pharmaceutical Products and Medical and Surgical Appliances of the past year—It should be understood that the information is supplied by the Makers—We invite all those concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference

A short written description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. The Editors cannot accept reference to circulars or catalogues as a compliance with these conditions, and cannot undertake to compile descriptions from such material.

In the section on Drugs, their composition, principal applications, and dosage should be stated in the fewest possible words

#### PROGRESS OF PHARMACY, DIETETICS, ETC.

Aendine, Non-staining.—5-amino-acridine, a non-staining antiseptic particularly valuable for skin sterilization (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Alugel —A colloidal suspension of aluminium hydroxide in gel form for the safe treatment of gastric hyperacidity and gastric ulcers. Alugel exhibits in a marked degree slow neutralization over the normal period of gastric digestion. Clinical evidence has shown that in the treatment of peptic ulcer with aluminium hydroxide freedom from pain and diarrhora (often a troublesome complaint whilst taking alkalis) was absent in every case except onc. Dose 1 to 2 teaspoonfuls undiluted or with a little water. (Wylcys Ltd., Coventry.)

Calsprin Tablets.—Contain 'Bayer' aspirin, gr 4, phenacetin, gr 1½, caffcing, gr ½, and calcium gluconate, gr 1 The combination of the two analgesics aspirin and phenacetin results in an intensified and prolonged action, while the addition of caffcine helps to allay the depression frequently accompanying pain. Calcium gluconate is added to increase tolerance and to avoid unpleasant taste. Calsprin is indicated for the treatment of simple headache, neuriligia and neuritis, and particularly for the relief of dysmenorrhora. Dosage is from one to two tablets, in water and after food, and the preparation is available in tubes of 20 and bottles of 250 tablets. (Bayer Products Ltd., Africa House, Kingsway, W.C.2.)

Carbachol.—Carbamyl choline chloride, a vasodilator and cardiac depressant usually injected, but active orally ——Issued in ampoules of 1 c c (containing 0.25 mg) in boxes of 100 ——(Ward, Blenkinsop & Co ——Ltd., Brooklands, Halewood, Liverpool)

Cetavion.—Cetyltrimethylammonium bromide Cetavion is a cleansing agent which possesses bactericidal properties and when used as a 1 per cent solution has no injurious action on the intract skim or on raw surfaces of wounds, burns, etc. Cetavion rapidly removes dirt and bacteria from the skim and hands and has been found to be an efficient preparation in the pre-operative wash up' of the surgeon's hands. It is also valuable as a cleansing and disinfecting agent for all kinds of abrasions, wounds, and burns. In skim diseases Cetavion has been found of value in removing ountment from the skim and the scabs and crusts in impetigo, dermatitis, eczema, etc. Baths, bowls, and other hospital vessels and fittings are readily and easily cleansed and disinfected with 1 per cent Cetavion. Cetavion is supplied in the form of a powder in 2-oz and 4-lb, containers. (Imperial Chemical (Pharmaceuticals) Ltd., 89, Oxford Street, Manchester, 1)

Cibazol Cream.—A non-greasy, water-miscible cream containing 5 per cent Cibazol (Sulphathiazole Ciba), introduced for first-and treatment of burns and as an alternative to Cibazol Cintment 5 per cent in the treatment of impetigo and other cutaneous infections. Containers of 1 oz. and 1 lb (Ciba Limited, Horsham)

Cibazol-Proflavine Powder —A combination of Cibazol (Sulphathiazole Ciba) 99 per cent and proflavine sulphate BP 1 per cent for application to infected wounds. Has the advantage of being active in serum, does not harm the tissues, and does not produce delay in healing Bottles of 15 g and 500 g (Ciba Limited, Horsham)

Cortrophia —Adrenocorticotrophic hormone of the anterior pituitary Constitution A polypeptide of smaller molecular size than other anterior pituitary hormones, soluble in N/100 HCl or NaOII Insoluble in lipioid solvents Aqueous solutions maintain activity after boiling Cortrophin contains only small or trace quantities of other hormones Standardization One sudanophobic unit is the least quantity of material that will totally regenerate the sudanophobic one of the atrophic adrenal cortex of young hypophysectomized rats within 5 days. Action Develops and maintains the size of the cortical layers of the suprarenal capsules and their power to secrete normal amounts of (a) The cortin like substances which control electrolyte balance, tissue hydration, carbohydrate assimilation, permeability of the capillaries, a maximum area of reticulo-cipithelial cells, and a proper degree of resistance to certain two condition entailing depression of the above, wherein the suprarenal bodies have not been irreversibly destroyed by disease such conditions will obviously include Simmonds' cachexia, anorexia nervosa, and many infective and other dehydrations including those of infants, convalescence from acute toxic infections, surgical wound or burn shock states uttended by concentration of the blood, certain severe allergic states. Dosage This must be proportionate to the degree of initial defliciency. Infants and slightly affected adults may need only 5 units a day. Severely deficient adults should continue until improvement is established. Subjects whose anterior pituitary has been completely removed or entirely destroyed by embolus, will naturally call for some maintenance therapy later. Form Ampoules containing 5 units and 10 units as an air-dry powder, with twinampoules of aqueous solvent, for intramuscular injection (Organon Laboratories Ltd, Brettenham House, Lancaster Place, London, W.C.2.)

Davitamen B<sub>1</sub> Superforte—Ancurm hydrochloride, in exceptionally high concentrations for urgent intravenous uses. Constitution Crystalline synthetic ancurm hydrochloride, 0 008 mg = 1 I.U. Action Is converted to its pyrophosphoric ester in the body, there to fulfil vital function as co-carboxylase permitting carboxylase to neutralize lactic and pyruvic acids, which otherwise intoxicate brain and nervous tissue and cardiac musculature. Inhibits weight-loss associated with rise of metabolic rate. Assists purine metabolism. Augments the effect of acetylcholine. Indications. Grave or acute states calling for any of these actions. Such include eclampsia and pre-eclampsia, cardiac failure during toxic infectious fevers, delirium tremens, acute pain during repair of injured nerves, acute gout. Dosage. 60 to 120 mg. intravenously, repeated as microssary. Form. Ampoules of apyretic aqueous solution containing either 60 mg or 120 mg. (20,000 or 40,000 I U.) for injection intravenously. (Organon Laboratories, Ltd., Brittenham House, Lancaster Place, London, W.C.2.)

Davitamon E (Synthetic Vitamin E) —Composition Racemic alpha-tocopheryl acetate (I I U of natural vitamin Is has the specific activity of 1 mg racemic alpha-tocopheryl acetate of the Standard Indications (1) Reproductive Has been used for premier separation of placenta, prophylaxis of habitual abortion, unexplained sterility of women and men, menstrual disorders, menopausal flushes, senile viginitis, pruntus vulva, madequate lactation (2) Neurological Has been applied in amytoma congenita, muscul ir dystrophy, tabes dors ills, anterior polionivititis, and during epidenics of this Dosage 3–40 mg i day Highest requirements are presumed in cases of habitual abortion (15–60 mg daily till full term) and in neuromuscular disorders (20 mg daily) Foxic effects unknown Form Tablets 3 mg and 20 mg (Organon Laboratories Ltd., Brettenham House, Lancaster Place, London, W C 2)

Dental Cones (M & B).—Each cone contains sulphathiazole, gr ½, and sulphanilamide, gr ½ When used following extraction, after-pain and the possibility of infection are minimized and healing promoted May be inserted in the sockets or crushed and the powder kept in place by a gaure tampon soaked in collodion. This cone has been specially designed to facilitate manipulation, and is exclusive to the proprietors Containers of 100 (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham

Dicoumarin —An anticoagulant substance for oral administration. The average dose is 4 (50 mg.) tablets daily at the beginning of treatment. The effect is delayed 2-3 days as 50-mg tablets (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool.)

Diemestrol.—Tablets containing 01 mg, 03 mg, 1 mg, and 5 mg of 3 4 pp'-dihydroxy-diphenyl-2 4-hexadiene For ovarian dysfunction, particularly in menopausal disorders, secondary amenorrhora, certain cases of menorrhagis, and in the inhibition of lactation Abso indicated in the treatment of prostatic cancer Dosage Menopausal disorders, 01 mg once or twice daily Inhibition of lactation, 03 mg daily for 3 or 4 days Kraurosis vulvice and pruritus vulvie, 03 mg three times daily for 7 to 10 days, repeated if necessary carcinoma of the prostate, as required to ameliorate symptoms (Glaxo Laboratories Ltd., Greenford, Middlesex.)

Diesestrol. -The most potent of the synthetic estrogens, a dihydroxy-diphenyl-hexadiene (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Diencestrol B D.H.—This synthetic cestrogen is now available in 0.3 mg tablets in addition to the 0.1 mg tablets formerly available. Both strengths are available in bottles of 25 and 100 (ertain higher strengths of tablets can be made to order for special purposes (The British brug Houses Ltd., Graham Street, London, N.1.)

Dithranol.—A skin antiseptic (dihydroxyanthranol) for the treatment of psoriasis, chronic eczema, alopecia areata, and dermatophytosis. Usually applied as an ointiment from 0.25 up to 3 per cent dithranol, twice daily. A patch test should be trued before extensive use. Issued as powder in bottles of 1 oz. (Ward, Blenkinsop & Co. Ltd., Brooklands, Halewood, Liverpool.)

Esoban Uf I Ointment.—Consists of the Esoban Ointment base with 25 per cent of Ull'I This preparation is indicated in staphylococcal, streptococcal, and other skin infections. It is also a powerful fungicide and is of proven value in the treatment of cpidermophytosis and monitiasis, and has been found effective in cases of pruritus an and vulvæ, ecthyma, bed-sores, chilblains, etc. Packed in small and large jars (Details on application to Sole Distributors, Chas F Thackray Ltd, 10, Park Street, Leeds, I, and 252, Regent Street, London, W.I Manufactured by Southon Laboratorics Ltd, London, S W 15)

Ethanolamine Oleate B D H —Under this name, monoethanolamine cleate solution (5 per cent, with 2 per cent of benzyl alcohol) is now issued for the treatment of varicose veins. Fackings are 2 e.c and 5 e.e ampoules (in boxes of 6) and vials of 20 c.e. (The British Drug Houses Ltd., Graham Street, London, N 1)

Ethisterone 'B W & Co' — Ethinyl testosterone, also known as pregnenunolone or anhydro-hydroxyprogesterone A derivative of progesterone possessing progestational activity when given by mouth Indicated in habitual and threatened abortion (supplemented if necessary by injections of progesterone), sternity due to luteal deficiency, functional uterine hæmorrhages such as metropathia hæmorrhagica, certain types of dysmenorrhæa, and (in conjunction with cestrogen therapy) selected cases of amenorrhæa Issued as 'Tabloid' brand Ethisterone, 5-ing, nottles of 25 and 100 (Burroughs Wellcome & Co (The Wellcome Foundation Ltd.) Temporary War-time Address 12, Red Lion Square, London, W.C.1)

Examen (New Potency).—Clinically tested to confirm that 1 c c contains the anti-anamic factor necessary for optimal response in permicious anamia in relapse. Indicated in permicious anamia and related disorders. Dosage. In relapse, 1 c c intramuscularly every two weeks, In maintenance, 1 c c intramuscularly every four weeks (Glaxo Laboratorics Ltd., Greenford, Middlesex.)

Flavogel Jelly.—0 2 per cent 5-amino-acridine hydrochloride (colourless flavine) in a water-soluble jelly base For disinfection of all wounds, cuts, scratches, boils, carbuncles, ulcers, whitlows, stings, etc Direct application on gauze or lint (Glaxo Laboratories Ltd., Greenfurd, Middlesex).

'Genatosan' Medicated Creams —A new range of medicated creams prepared with an emulsifying base, characterized by their non-greasy and water-miscible nature and corresponding in formula to ointments of recognized value in the treatment of skin diseases. The creams are readily absorbed and when necessary may be removed easily from the skin or clothing without the aid of soap or friction. In these and other respects the 'Genatosan' creams present advantages over the fat- or paraffin-containing omtiments in common usage. Evamples in the range. No 2, Sulphanilamide 5 per cent, No 3, Benzyl Benzoate 10 per cent. No 6, Gentian Violet 0.5 per cent, No 8, Whitfield's formula, No 13, Ichthammol 5 per cent, No 14, Sulphathiazole 5 per cent. In addition to the standard preparations in this range, creams corresponding to physicians' own formulæ and incorporating the 'Genatosan' base can also be supplied. (Genatosan Ltd., Loughborough, Leics.)

Gentian Violet Pills 'Bayer' —Contain the pure medicinal form of gentian violet and are employed orally in the treatment of oxyuriasis. A course of treatment lasts eight to ten days, and may, if fiecessary, be repeated after a rest period of seven days. The suggested dosage for adults is two ½-gr pills three daily, while children receive approximately ½ gr per day for each year of apparent (not chronological) age. Gentian violet is contra-indicated in roundworm infestation, and in cardiac, hepatic, renal, and gastro-intestinal disease. Special enteric-coated pills are available containing gr ½, gr ½. (Bayer Products Ltd., Africa House, Kingsway, W.C.2.)

Globia Insulm (with Zinc) AB—This modified insulin, the action of which is intermediate in duration and intensity between that of Insulin AB and Protamine Zinc Insulin AB, is now available Vials containing 5 cc of 40 units and 80 units per c c are issued (The British Drug Houses Ltd., Graham Street, London, N I)

Hexa-Mandelate (Southon) —This new chemotherapeutic is an ester of hexamethylene and mandelic acid intended for the treatment of B coli infections of the genito-urinary tract, pre-liminary reports indicate that it is also effective against pyocyaneus. It can be administered in the pyelitis of pregnancy, and the suggested dose of one tablespoonful can be trebled if required, whilst the dose for children is one or two teaspoonfuls according to age. The usual difficulties

of mandelic acid therapy have been overcome with Hexa-Mandelate, which is fully active in all the urinary pH ranges without the addition of ammonium chloride or a ketogenic diet and does not produce gastro-intestinal irritation Dosage Adults One tablespoonful every three to four hours Children One to two teaspoonfuls Supplied in 12-oz bottles (Details on application to Sole Distributors, Chas F Thackray Ltd., 10, Park Street, Leeds, 1, and 252, Regent Street, London, W 1 Manufactured by Southon Laboratories Ltd., London, S W 15)

High Potency Ostelin Each 1-(c ampoule contains 75 mg (300,000 IU) of vitamin D (taltiferol) For frenting at and prevention by 'single massive dose' technique of rickets and infantile tetany Single dose of 75 mg. (300,000 IU) For special applications, information on request. (tdaxo Laboratories Ltd., Greenford, Middlesex.)

Hyperduric Injection Solutions - These contain morphine and other bases as mucates instead of the usual sults. They allow a slow and uniform liberation of the active bases with controlled prolongation of the pharmacological action (Allen & Huburys Ltd., Bethnal Green, London, E.2.)

Hyperduric Adrenaline Contains adrenaline mucate equivalent to a 1-1000 solution of the base Indication Bronchial asthma Relief lasts 8 to 10 hours Dose 0 2 to 0 5 cc (3 to 8 minims), increased to 1 c c. if necessary (Allen & Hanburys Ltd., Bethnal Green, London, E 2.)

Hyperduric M.H.A.—Contains in each c. i gr of morphine, si, gr of hyosene, and si gr of adrendine, as mucates. Produces annessa and narcosis which develop in 30 to 40 minutes, reach peak after an hour, and continue for 6 to 8 hours, the adrenaline preventing fall in blood-pressure and other side-effects of hyoseine Indications Preparation for inhalational, spinal, or local anesthesia, 'twilight sleep' during labour, rule of pain and restlessness after serious accidents, especially in shock after crushing injuries or fractures. Dose 1 cc (Allen & Hanburys Ltd., Bethind Green, London, E.2)

Hyperduric Morphine. Contains in each c c \( \frac{1}{2} \) gr of morphine alkaloid as mucate Action is apparent in 20 to 40 minutes after injection, and relief from pain lasts 8 to 12 hours and vomiting are much rarer after \( \frac{1}{2} \)-gr doses of the mucate than after \( \frac{1}{2} \)-gr doses of the tarrate Indications Pain needing prolonged analgesia—e.g., in war wounds (before transport of casual-tics and to reduce liability to traumatic shock), inoperable carcinoma, renal colic, acute osteonyellitis, septic wounds, chronic cystitis, and the headache and delirum of meningits Dose 0.5 to 1 c.c intramuscularly. (Allen & Hanburys Ltd., Bethnal Green, London, b. 2.)

Injection of Liver Extract 'Wellcome' - For intranuscular injection in the treatment of pernicious anamin and other types of mucrocytic anamin. Prepared by a special process designed to conserve all the thorape attently-active constituents of liver, while diministing mert or antigeme protein and other undesirable substances. It contains, in addition to the anti-anamic principle, a full representation of the components of the vitamin B complex normally present in liver Issued in hoxes of 8, 25, and 100 ampoules, each contaming 2 c. (Burroughs Wellcome & Co (The Wellcome Foundation Ltd.) Temporary War time Address. 12, Red Lion Square, London, W.C. 1.)

Injection Nikethamide. Nicotinic acid dicthylamide, a circulatory stimulant, in 25 per cent solution. Issued in 15-c.c rubber-capped bottles and in 2-c.c ampoules (Ward, Blenkinsop & Co. Ltd., Brooklands, Halewood, Liverpool)

KI-uma Qinument. hi uma ointment, the result of considerable laboratory research and clinical experiment, is a scientific combination of ingredients of proven therapeutic value, and outstanding among these is salicylic enter of ethylene chlorhydrin (E C S.) Applied externally, it passesses unusual penetrative powers. Whereas salicylic esters of the primary alcohols such as methyl salicylate split fairly easily with the production of free salicylic acid, it seems that the specificity of E C.S. is due to a more complex chemical fission. It is free from undue toxicity and is tolerated in large quantities, whilst the usefulness of methyl salicylate and similar esters is limited by their tendency to produce toxic reactions. Moreover, there is no evidence of inntoward local reactions such as occur with more readily hydrolized salicylic esters. Formula, Salicylic ester of othylene chlorhydrin 12 5 per cent, aleps lane 20 per cent, paraff due. 5 2 per cent, of enealyp 2 5 per cent, oil, plni pumil 2 5 per cent. Indications. Rheumatism, rheumatic, pains, rheumatich arthritis, goot, scintica, lumbago, neuritis, fibrositis, stiff and swollen joints, neuralgia, stiff neck, braises, strains, etc. Directions. The affected parts should be lathed with hot water and thoroughly dried Ki-uma ountment should then be rubbed in lightly immediately afterwards. (Westminster Laboratories Ltd., Penn, Bucks.)

Lactedavine Bayer. The pure crystalline, synthetic riboflavin (also referred to as vitamin B<sub>4</sub> or G) in accordance with the standards set out in the British Pharmacopoeia, investigations have shown that patients given a dict very low in riboflavin developed chelosis, and a sealy desquamation in the naso-lablal folds and in some cases on the ears and eyelids, after abordards administration these lesions disappeared Lactoflavine Bayer' may be given for the prevention and treatment of ariboflavinosis characterized by glossitis, seborrhose follicular prevention and treatment of ariboflavinosis characterized by glossitis, seborrhose follicular prevention and treatment of starbaness including conjunctivitis, keratitis, photophobia, and keratosec, chelicolis, and ocular disturbaness including conjunctivitis, keratitis, photophobia, and twilight blindness. Also for pellagra in conjunction with nicotime acid and vitamin B. Theratuilight blindness. Also for pellagra in conjunction with nicotime acid and vitamin B. Theratuilight blindness. Also for pellagra in conjunction with nicotime acid and vitamin B. Theratuilight blindness. Also for pellagra in conjunction with nicotime acid and vitamin B. Theratuilight blindness. Also for pellagra in conjunction with nicotime acid and vitamin B. Theratuilight blindness.

Lerugen.—Histamine apoproten Histamine combined with despeciated horse-serum globulin Based on the hypothesis that histamine released from tissue cells by an antigen antibody reaction plays a fundamental role in anaphylaxis and allergy. Lertigen has been found useful in the treatment of allergic conditions which have failed to respond to routine methods or those in which the allergen cannot be discovered or avoided. Used particularly in contact dermatitis due to allergens, and in abnormal sensitiveness to heat, cold, or light Administerial substitutionally in gradually uncreasing doses every four or five days, commenting with 0.05 c to 0.1 cc. (Parke, Davis & Co., London, W.1.)

'M & B 698' Sterilized Sulphapyridine Powder

For topical application in the prophylaxis of infection before or after surgical treatment or to assist in the control of infection in its early stages. The danger of absorption of toxic amounts is considerably less than with sulphaniamide and less than with sulphathazole Containers of 12 g (Pharmaccutical Specialities (Max & Baker) Ltd., Dagenham)

Methyl Testosterone 'B W. & Co' A derivative of the natural testicular hormone, possessing greater activity when given by mouth. Indicated in the treatment of hypogonadism, delayed puberty, cryptorchidism, sterility and impotence of endocrine origin, and beingn prostate hypertrophy in the male, also used in menstrial irregularities, in nonpausal symptoms, and for the suppression of lactation in the female—Issued as "Tabbout" braind Methyl Testosterone, 5-mg, in bottles of 25 and 100 (Burroughs Wellcome & Co (The Wellcome Icoundation Ltd.) Temporary War-time Address—12, Red Lion Square, London, W. (1)

Methyl Thiouracii.—The mode of action, absorption, and distribution of this drug are like those of thouracii (q v). The dosage has been lower than that of thiouracii. Initial dosage 200-500 mg in 4 to 5 divided doses, decreased as retting pulse-rate and B. W.R. fall and symptoms abate. Maintenance dose, 50-100 mg once daily. Overdosage as in thiouracii. The clinical effects are similar to that seen with thouracii. Methyl thiouracii, though under laboratory and clinical test for a shorter time than thiouracii, has not, within the above range, yet shown the toxic effects reported with thiouracii. Supplied in 50-mg and 200 mg tablets (Organon Laboratories Ltd., Brettenham House, Lancaster Place, London, W.C.2.)

Micryston —Consists of micro-crystalline suspensions of cestrone, testosterone, and progesterone Each is individually packed, biologically standardized, and used exclusively for intra muscular injection—Issued to the Medical Profession in 8 cc bottles—(Contes & Cooper Ltd Temporary Address—21, Eastbury Road, Northwood, Middlesex—)

Morbulia Hæmorrhoidal Suppositories Combine the mildly astringent and emollient properties of bismuth oxygodogallate and zine oxide, with healing properties of cod liver oil. Indications Hæmorrhoids and alhed milammutory conditions of the ano-rectal region. Relief of irritation pruritus an Composition Ol morth, BP, 100, zine oxid BP 100, buls Peru 50, bis oxygodogallas 25, base, q s 1000. Directions for use One suppositories to be inserted right and morning. In severe cases the suppositories should be used more frequently and the treatment continued for some days after apparent healing has taken place. (Priory Laboratories Ltd, 21, Eastbury Road, Northwood, Middlesex.)

Neutral Proflavine Sulphate – This is the monosulphate of 2 8 diamino acridine The acidity of the flavines is regarded by many as an undesirable characteristic which may be the cause of untoward tissue reactions. Neutral Proflavine Sulphate is free from this disadvantage. It is soluble in water and in saline, and the 1-1000 solution has a pH of 6 2 6 5, thus the solution is almost neutral in reaction and the addition of buffering agents is unnecessary. In laboratory tests using Staph aureus, Str. pyogenes, and Pseudomonas pyocyanea. Neutral Proflavine Sulphate has been compared with acriffavine B P and proflavine sulphate B P. The results indicate that the new compound is the most effective. Neutral Proflavine Sulphate is at present undergoing clinical trials and preliminary reports are encouraging. It may be employed in the same strengths (1-1000 solution or in powder form) and for the same purposes as proflavine B.P. It is available in solution tablets of 0.875 gr and 1.75 gr, and also as a powder. (Imperial Chemical (Pharmaceuticals) Ltd., 89, Oxford Street, Manchester, 1)

Nicotinamide.—The naturally-occurring form of the pellagra-preventing vitamin of the B complex, part of the cozymase molecule Ingestion of the amide is not attended by secondary fushing or toking reactions such as have been reported with the free acid. Issued as tablets of 50 and 100 mg (Ward, Blenkinsop & Co. IAd., Brooklands, Halewood, Liverpool.)

Nicotinamide (Boots).—The amide of nicotinic acid. It is as efficacious as nicotinic acid in curing a deficiency of the latter. The value of nicotinamide, compared with nicotinic acid used as a vitamin, lies in its absence of any unpleasant vissolilator effects. Used in conditions associated with dermatitis, diarrhora, and dementia. The average oral dose is 50 to 150 mg three times a day after meals, or 50 to 150 mg, by injection. Supplied in tablets each containing 50 mg and ampoules containing 50 mg in 2 c. (Boots Pure Drug Co Ltd., Nottingham.)

Nicotmanude 'Roche'.—Nicotinamide tablets, each containing 50 mg, have been recently introduced and are intended to replace the nicotinic acid tablets of the same strength in cases where it is desired to circumvent the side-effects of flushing which follows administration of the acid Nicotmanude 'Roche' tablets are issued in packings of 25, 100, and 500 tablets and are exempt from Purchase Tax Prices of nicotinic acid tablets were reduced during 1944. (Roche Products Ltd., Welwyn Garden City.)

Nicotinic Acid.—The pellagra-preventing portion of the vitamin B complex, also found useful in atypical states of deficiency and related conditions. A valuable vasodilator. Average dose 1-2 tablets daily Issued in tablets of 50 mg. (Ward, Blenkinsop & Co. Ltd., Brooklands, Halewood, Liverpool)

Nikethamide (100 per cent) — Nicotinic acid diethylamide, a circulatory stimulant (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Nikethamude 'Bayer'.—The synthetic analeptic, pyridine-3-carboxylic acid diethylamide, available as an aqueous solution for parenteral and oral administration. Indicated in all cases of shock, in cases of poisoning by carbon monoxide, narcotics, and barbiturates, collapse, drowning, for circulatory failure and coronary thrombosis, asphwia neonatorum, respiratory depression during anæsthesia, and as an adjuvant in the treatment of acute infections, such as pneumonia. In chronic and mild conditions, nikethamide may be given orally, in 1- or 2-c c doses. In acute conditions it is given subcutaneously or intramuscularly in 2- or 3-c c doses. Cases of severe collapse may require intravenous or even intracardiac injection of from 5 to 15 c c. In children the average dose is one-half, while infants may be given one-quarter the adult dose. Available in ampoules of 25 per cent solution in 2 c c, and for oral administration, bottles of 15 c c. (25 per cent solution). (Bayer Products Ltd., Africa House, Kingsway, W C 2)

Ouabain, A & H—G-Strophanthin (crystalline), which is about twice as potent as k-strophanthin (amorphous) Injection solution containing 0.25 mg in 1 cc Indications. Acute and chronic failure of left side of heart. Dos. 0.25 mg intravenously daily for 5 to 6 days, up to a total of 2 mg, if the patient tolerates 0.25 mg a dose of 0.5 mg may be given every 24 hours, to a total of 3 to 4 doses, if necessary, in acute heart failure, a single dose of 1 mg may be given, for children under 4 years the dose is 0.06 mg, and over 4 years, 0.12 mg (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

'Ovendosyn' Forte —Recent research has fully established the value of cestrogenic treatment in carcinoma of the prostate and suggests its possible advantages in inoperable breast cancer Since relatively large doses of stilbestrol are sometimes required for treating these two malignant conditions, 'Ovendosyn' Forte has now been made available, each tablet containing 5 0 mg stilbestrol and 325 mg calcium phosphate The calcium content minimizes unpleasant reactions and also serves to accelerate the regression of secondary cancerous deposits in bone. For a number of years the standard 'Ovendosyn' Tablet (0 5 mg stilbestrol and 290 mg calcium phosphate) has proved highly successful in controlling the physical and psychic manifestations of the menopause by providing a complete replacement therapy with negligible side-effects Trials to data suggest that the new-strength tablet will prove no less efficacious in its own sphere (Menley & James Ltd., 123 Coldharbour Lane, London, S E 5)

Papaverine, Synthetic.—Papaverine 15 not habit-forming, and not in the Dangerous Drugs list Issued as free base or hydrochloride (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Pethidine Hydrochloride (Boots) —A new synthetic analgesic comparable with morphine but claimed to be less narcotic and to possess a strong spasmolytic action. It is the hydrochloride of the ethyl ester of 1-methyl-4-phenyl-piperidine-4-carboxylic acid, and is a stable colour-less crystalline powder, neutral in reaction, and freely soluble in water Pethidine has proved to be particularly useful in neuralize pain, in pain due to vascular disease or muscular spasmi, and is an obstetric analgesic. An initial dose of 50 to 100 mg followed by 50-mg doses at intervals is suggested for oral administration. Injections of 50 to 100 mg intramuscularly, or up to 150 mg intrivenously followed in one hour by 100 mg intramuscularly, may be given and repeated to a total of 400 mg. Supplied in tablets of 25 and 50 mg and ampoules of 50 and 100 mg, in 2 c (Boots Pure Drug Co Ltd., Nottingham.)

Pethidine Hydrochloride 'Roche'.—A new strength of pethidine tablets has been issued, each tablet containing 50 mg., which is twice the strength of the previous pethidine tablet. This preparation is increasingly used as an analgesic and antispasmodic, and favourable reports are appearing concerning its effectiveness during labour, asthma, dysmenorrhoea, and in renal and billary colic. Pethidine Hydrochloride has also been given to relieve the pain in fractures (Roche Products Ltd., Welwyn Garden City.)

Phemitone (Boots).—Phemitone is N-methyl 5-phenyl-5-ethylbarbitum acid for the treatment of epilepsy. It is considerably less toxic than phenobarbitone and possesses the great advantage of being practically free from the hypnotic effects usually associated with phenobarbitone and bromides. The average daily dose is one tablet of 3 gr during or just after meals two or three bromides at the acid of the changing to Phemitone from phenobarbitone or bromides, these drugs should be withdrawn slowly. The best procedure is to reduce the dose of phenobarbitone or bromides, commenting with a small dose of Phemitone and gradually reducing the dose of phenobarbitone or bromides and increasing the Phemitone dosage until it is just sufficient to prevent convulsions Supplied in tablets of gr ½ (0 03 g) and gr 3 (0 2 g) (Boots Pure Drug Co Ltd., Nottingham)

Pheniodol Granules (M & B) and Pheniodol Suspension (M & B).—Two convenient and palatable forms of pheniodol for oral administration in cholecystography Granules supplied in single tubes and boxes of six, each containing the equivalent of 3 g Suspension in bottles of 1 oz and 6 oz containing 3 g per fluid oz. (Pharmaceutical Specialities (May & Baker) Ltd., 1) agenham )

Pholedrine Stimatone.—Hydroxyphenylisopropylmethylamine A circulatory stimulant for hypotension, collapse, and surgical shock Issued in 15-c c rubber-capped bottles (cartons of 12) and 1-c c ampoules (boxes of 5). (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Preflavine Hemisulphate (M & B).—The official salt (proflavine sulphate) is an acid sulphate yielding acid solutions which are usually neutralized or buffered before use. The hemisulphate is a neutral salt for use in place of the sulphate for the preparation of solutions and for application to wounds Bottles of 5, 25, 100, and 500 g. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham)

**Promanide** — Sodium p,p'-diaminodiphenyl-sulphone-N,N'di [dextrose sulphonate] One of the few chemotherapeutic agents capable of inhibiting the tubercle bacillus Supplied as a 5 per cent Jelly and Ointment for topical application in superficial tuberculous lesions. The Jelly is particularly indicated in tuberculous sinuses and abscesses, and the Ointment for lupus of the ulcerative type 

Jars containing approximately 2 oz (Parke, Davis & Co , London, W 1)

'Prostigmin' Ophthalmic Solution.—'Prostigmin' has been found superior to eserine in the treatment of acute and chronic glaucoma in that it is far less apt to cause symptoms of hypersensitivity. It can be tolerated for longer periods than the alkaloid, fewer systemic reactions occur and far less local unpleasantness. For convenience in ophthalmic Solution (dimethylcarbamic ester of hydroxy-phenyl-trimethyl-ammonium-methyl-sulphate 3 per cent, boric acid 3 per cent) has been introduced in amber glass bottles with dropper attachment. Satisfactory results have been reported in other ophthalmic affections, including Garden City)

Proteolysed Liver, A & H.—Prepared by a digestive process that preserves and liberates the hæmatopoietic factors of whole liver but eliminates the nauseating flavour—Indications—For oral administration in permicious and other megalocytic anæmias when the use of liver extract by injection is unsuitable—Exempted from the official prohibition against the oral administration of liver preparations—Dosage (in soup or warm water)—Initial, 15 to 30 g (4 to 8 heaped teaspoonfuls), representing 4 to 8 oz of liver, daily, for maintenance, reduced, as the case allows, to 4 to 8 g (1 to 2 heaped teaspoonfuls) daily—(Allen & Hanburys Ltd., Bethnal Green, London, E.2)

**Riboflavine B D H**—Ampoules of solution of this member of the vitamin  $B_{\epsilon}$  group are now issued containing 10 mg in each 2 c c instead of 1 mg in 2 c c as in the past (The British Drug Houses Ltd , Graham Street, London, N 1 )

Skiadin — Iodized poppy-seed oil For visualization of the bronchi, the pleural cavity, spinal column, or the general tract for the taking of radiographs Issued in 20-c c rubber-capped bottles (cartons of 12) (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Sodium Stibogluconate 'B W & Co'.—A pentavalent antimony compound for intravenous or intramuscular administration in the treatment of kala-azar. Its low toxicity enables intensive antimony therapy to be carried out with little risk to the patient, so that a high rate of cures is obtained with the minimum of hospitalization. Issued as 'Wellcome' brand Injection of Sodium Stibogluconate, a sterile isotonic solution containing the equivalent of 20 mg of pentavalent antimony in each cc, in boxes of 10 ampoules each containing 6 cc. (Burroughs Wellcome & Co (The Wellcome Foundation Ltd) Temporary War-time Address 12, Red Lion Square, London, WC 1)

Streptocide Lozenges —Tins of 50 and bottles of 250 Each Streptocide Lozenge contains 1 gr (0 065 g) Streptocide (Sulphanilamide-Evans) incorporated in a suitably flavoured base. The lozenges are indicated for the local treatment of tonsillitis, pharyngitis, and other bacterial infections of the mouth, pharynx, and upper respiratory tract where the infecting organisms are known to be susceptible to sulphanilamide Streptocide lozenges are also of value in dintal surgery for cases of multiple extractions and slow-healing wounds. The slow release of sulphanilamide from the lozenges enables continuous medication to be effected at the required sites. (Evans Sons Lescher & Webb Ltd , Liverpool)

Sulphacetamide Soluble Steramide.—Steramide forms a highly water-soluble, nearly neutral sodium salt which is non-irritant even in 30 per cent solution when applied to the cornes or to mucous surfaces. It is available solid, in solution, as an ointment, and for nasopharyngeal use in a solution with adjusted surface tension. Issued as powder in cartons of 50, 100, 250, and 500 g, as 10 per cent and 30 per cent solutions in 25-c c, pipette bottles (boxes of 12), and in 100-, 250-, and 500-c bottles, as ampoules, 5 cc (boxes of 5), and as nasopharyngeal solution I oz pipette bottles (boxes of 12), ointment, tubes of 1 drachm and of 25 g (boxes of 10), and also burn, wound and first aid dressing in tubes of 25 g (Ward, Blenkinsop & Co Ltd., Brooklands, Halewood, Liverpool)

Sulphamezathne — Sulphadmethylpyrimidine A sulphonamide of low toxicity which has been used with success in pneumonia—primary and secondary, meningitis—meningococcal, streptococcal, and pneumococcal, hamolytic streptococcal infections, and Bact coli infections of the urinary tract. Sulphamezathine is rapidly absorbed so that a high blood level is readily reached, and as the drug is relatively slowly excreted, the blood level muy be maintained on 6-hourly doses. The acetyl derivative of Sulphamezathine is so soluble that the risk of urinary damage is minimal. The almost complete absence of toxic effects following the administration of Sulphamezathine has been noted in the papers which have been published. In the form of the sodium salt, its administration by the intravenous or intramuscular route does not give rise to local reactions. Sulphamezathine is available in 0.5 g tablets and as a powder. Ampoules of Sulphamezathine Sodium, equivalent to 1 g and 3 g of Sulphamezathine, in 3 cc. and 9 cc. sterile aqueous solution, are also available. (Imperial Chemical (Pharmaceuticals) Ltd., 38, Oxford Street, Manchester, 1)

Sulphanilamide Cream 'Wellcome' —Presents 5 per cent of sulphanilamide in a stable, water-miscible base designed to promote optimal conditions for utilization of the drug. It is intended for application to burns, scalds, and superficial wounds as a prophylactic against infection, and for the treatment of skin disorders amenable to local sulphanilamide therapy. Issued in glass pots of \( \frac{3}{4} \) oz, 3\( \frac{1}{4} \) oz, and I lb (Burroughs Wellcome & Co (The Wellcome Foundation Ltd.) Temporary War-time Address 12, Red Lion Square, London, W C I)

Sulpharsan (Sulpharsphenamine-Evans) --Ampoules of 0.15 g, 0.30 g, 0.45 g, and 0.60 g Evacuated and hermetically scaled Issued in boxes containing 1 ampoule and 10 ampoules respectively Made and biologically tested at The Evans Biological Institute Sulpharsan is manufactured under licence granted by the Ministry of Health, London, and is approved for the purpose of the Public Health (Venereal Diseases) Regulations, 1916 (Evans Sons, Lescher & Webb Ltd., Liverpool.)

Surface Active Saline Mixture of Azochloramid.—A new and interesting development of Azochloramid therapy is the introduction of Surface Active Saline Mixture of Azochloramid. This is the actival outcome of much experimental and clinical work, which has shown that combination of the wetting agent, sodium-tetradicyl-sulphate, with Azochloramid, markedly enhances the already powerful bacteriedal affect of the latter. By reason of its surface-tension depressant effect, sodium tetradicyl-sulphate liqueties pus and organic aggregations and allows the active antiseptic to penetrate otherwise macessible areas. It has also a mildly débriding action which facilitates the separation of slough, fibrin, and necrotic tissue. It does not appreciably milhibit the plangocytic activity of leucocyte's Surface Active Saline Mixture of Azochloramid which combines in one mixture, ready for use, Azochloramid and sodium-tetradecyl-sulphate, with buffering salts, is being employed with excellent results in the treatment of tuberculous empyema and reports have shown that re expansion of the lung has been achieved in a high percentage of cases following its use (Tubercle, November, 1943). It is also employed with advantage in localized infections and for irrigation of deep lessons. Another of the range of Azochloramid preparations, Azochloramid in Triacetin 1 500, has recently been shown to have an almost specific effect in the treatment of fungus infections of the feet. (Wallace & Tiernan, Ltd., Power Road, London, W. L.)

Synapoldin. This combination of choronic genadotrophin (luterazing hormone) from human pregnancy urine and the follicle stimulating hormone from the anterior lobe of the pituitary gland is a patent genadal simulant. For the stimulation of ovarian activity in women with functional mensional disorders and sterility resulting from deficiency of pituitary genadotrophins. In the male subject the follick-stimulating hormone acts only on the germinal epithelium, increasing spirmatogenic activity; the luttimizing hormone acts on the interstital sceretory elements of the tests, inducing secretor of the male hormone. Administered intramuscularly, two or three times weekly, in doors of 1 cc to 2 cc. In sterility in the female due to fullure of ovulation, doses of 1 cc daily during the week preceding evulution are given. Synapoidin is supplied in 10-cc rubber capped vials, each cc containing 15 synergy rat units (Parke, Davis & Co., London, W.1.)

'Synkavit' Tablets. An additional packing of 500 'Synkavit' tablets 10 mg euch has been made available 'Synkavit' vitamin is analogue is stable and suitable for oral use without bild salts, and in ampoules for intravenous, hypodernic, or intramuscular injection. Its use is indicated in hypoprothrombinamia associated with certain hamorrhagic affections, e.g., in obstructive jaundice, especially post operatively, hemorrhage due to smilar obstructive conditions or imperfect absorption, and in neonatal hamorrhage. (Roche Products Ltd., Welwyn Garden (ity.)

"Syntropan". - "Syntropan", synthetic atropine analogue used as an antispasmodic in various conditions, including dysmenormal, etc., is now available in an additional packing of 100 tablets, each containing 50 mg (Roche Products Ltd., Welwyn Garden City.)

Testesierous Propionate 'B. W. & Co.'. An ester of the natural testicular hormone, possessing greater and more prolonged activity than testosterone itself. Indicated in the treatment of delayed puberty in the male, impotence associated with endocrine insufficiency, and prostate hypertrophy, and in menorrhagia, dysmenorrhoca, mastifis, and for the suppression of lactation in the female. Issued as 'Wellcome' brand Injection of Testosterone Propionate, in ampoules of 5 mg, in 1 e c, and 10 mg in 1 c.c. (each in boxes of 6) and 25 mg in 1 e c (issued singly) (Burrough Wellcome & Co. (The Wellcome Foundation Ltd.) Temporary War time Address 12, Red Lion Square, London, W ('1)

Theelis (Aqueeus Suspension).— Acto-hydroxy-estratriene Lespecially useful in menopausal symptoms and sequelse when large doses are to be administered. There is evidence to show that it has some repository action, and that it is definitely less painful than the usual oil solution initial doses should be 2 mg. intranuscularly twice weekly, and after the relief of symptoms a maintenance dose of 0 1 mg. a month is often sufficient. Supplied in boxes of 6 ampoules of 1 cc. each cc. containing 2 mg. (20,000 I U) of Theelin suspended in normal saline solution (Parke Davis & Co., London, W I),

'Thiazamide' Sterilized Sulphatbiazole Powder...'Thiazamide' brand of sterilized sulpha thiazole powder for application to wounds for the prophylaxis of infection before or after surgical treatment or to assist in the control of actual infection during its early stages Containers of 12 g. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

'Thiasamide' Sterifised Sulphathiasole with 1 per cent Proflavine Hemisulphate.—For use in the same manner and in the same dosages as a mixture of sulphathiazole and 1 per cent proflavine sulphate for the prevention and treatment of wound infection. Has the advantage of containing a neutral sait of proflavine. Containers of 12 g (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

Thiouracil —Indication For the treatment of thyrotoxicosis, (a) primary, (b) toxic adenoma, (c) thyrotoxicosis recurrent after partial thyroidectomy. Presence of other endocrine disorders, pregnancy, or a low initial white-cell count are not contra-indications to treatment. Cases of tachycardia and high B MR that are not truly thyrogene will not respond. Cases modified by recent iodine therapy are refractory to thiouracil until their iodine stores are used up. Mode of action Drug acts by competing with the thyroid for iodine, the glund being starved of iodine cannot put out thyroxine, though it becomes cytologically more active while influence of thiouracil lasts. The persistent activity of the anterior pituitary induces enlargement of the individual lasts. The persistent activity of the anterior pituitary induces enlargement of the individual thyroid cells surrounding depleted alveoli. Absorption and distribution. Quickly absorbed from gastro-intestinal tract to be distributed throughout the body tissues and fluids. About one-third of the ingested drug is excreted unchanged in the urine, none in the faces. Dosage Initial dosage should never exceed 600 mg daily, in 3-5 divided doses. To be stepped down as resting pulse rate and B MR fall and symptoms abate. The lower the daily total the less division is needed. Recovered cases need maintenance of 50-100 mg once daily. Overdosage. Shown by rapid significant enlargement of the thyroid, malaise, and apally. Clinical effects Marked subjective improvement should precede all else, optimal recovery in 2-11 weeks, rapid drop in resting pulse-rate and the B MR after latent interval of 2-26 days. B M.R. normal within a few weeks, with coincident rise of blood-cholesterol. While metabolic rate is still declining the patient regains weight, and tremor, overactivity, sweating, peripheral vasodilatation, and vascularity of thyroid gland usually revert to normal. Staring, shiny appearance of eyes is lost though exophthalmos is unaltered. Thyroid becomes softer though size is

Theorem B D H.—The use of theorem is now becoming a standard procedure for the control of thyrotoxicosis and tablets each containing 0 05 g, and 0 1 g are now issued in addition to the original 0 2 g tablets. All three strengths are issued in bottles of 100 and of 500 tablets (The British Drug Houses Ltd , Graham Street, London, N 1.)

2-Theorraci (M & B).—For oral administration in the treatment of thyrotoxicosis Supplied in 0.05 g, 0.10 g, and 0.20 g tablets, in bottles of 100 and 500 (Pharmaceutical Specialities (May & Baker) Ltd , Dagenham )

Thrombin, Topical—A purified thrombin concentrate prepared from bovine plasma. It is an exceptionally powerful and rapidly acting hæmostatic agent, and the contents of one 5000-umit ampoule of Thrombin, Topical (P, D & Co) dissolved in 5 c c of normal sulme is capable of clotting an equal volume of blood in less than one second and ten times its volume in three seconds. Of special value in skin grafting for the control of hamorrhage and the fixation of transplants. A useful adjunct in abdominal surgery, bone and bruin surgery, dental extractions, operations on nose, throat, and mouth, etc. Supplied in boxes containing one ampoule of 5000 units with a 5-c c ampoule of sterile isotonic saline. (Parke, Davis & Co, London, W 1)

Tineacide.—Contains 2 per cent of isothymol and 10 per cent of safrole (antimycetics), 1 per cent of ti-tree oil (antiseptic), and 3 per cent of benzocaine (antiprurità), in a fungistatic vehicle that promotes absorption of isothymol and safrole A new, effective ointment for athlete's foot, ringworm of the hands, dhobie itch, and other forms of ringworm of the skin and nails. Rapidly heals the lesions and allays the itching Pleasant to use and non-irritant. To be rubbed into the affected areas nightly or might and morning, with the usual cleaning of affected parts and dismfection of clothes, and for two or three weeks after apparent cure. (Allen & Hanburys Ltd., Bethnal Green, London, E 2)

Trilene.—Trilene is specially purified, stabilized, and distinctively coloured trichlorethylene prepared for anæsthetic purposes. It should not be confused with the commercial grade of trichlorethylene used in industry, which is not suitable for anæsthetic administration. Trilene requires a closed apparatus and can be used either as a vapour mixed with air, or as an adjuvant to  $N_2O$ ,  $O_3$ , and, or other. It must not be administered in a closed circuit with sods lime. Trilene may also be employed to produce analgesia without loss of consciousness, and has proved a valuable agent for this purpose in midwifery, dentistry, painful dressings, etc. To distinguish it from other anæsthetics Trilene is coloured blue by the addition of a harmless dye. It is supplied in  $\frac{1}{2}$ -lb and 1-lb bottles. (Imperial Chemical (Pharmaceuticals) Ltd., 89, Oxford Street, Manchester 1) plied in 1-lb and 1-lb bottles Manchester 1)

Tabercular Diagnostic Jelly, A. & H.—Contains 95 per cent of old tuberculin and 5 per cent of mert adhesive. For diagnosis of tuberculous lesions by a percutaneous reaction. To be applied to a cleaned area of skin and covered with a piece of gauze held in position by sticking plaster Positive reaction, reddened or slightly vesicular mark, appears in about 48 hours to 1 week (Allen & Hanburys Ltd., Bethnal Green, London, E 2)

UFI. (Urea Formic Iodide) —A white, water-soluble, non-staining, non-toxic, and non irritating powder consisting of a mixture of methylene-di-ureide and di-methylene-tri-ureide with ionizable iodine and free urea, the urea being retained because of its power of absorbing necrotic matter and hastening healing UFI is bacteriostatic to aerobic and anaerobic organisms including pyocyaneus and proteus Indicated in the treatment of infected wounds and burns and as a general surgical prophylactic by implantation. The powder has a melting point of 81°C, and in the presence of moisture at body temperature coalesces to form a protective frost which is slowly absorbed. The ionizable iodine, in the presence of moisture, causes the polymerization of the ureides with the free urea, thus preventing the absorption of free urea and the consequent

rise of uren in the blood-stream (Details on application to Sole Distributors, Chas F Thackray Ltd., 10, Park Street, Leeds, 1, and 252, Regent Street, London, W 1 Manufactured by Southon Laboratories Ltd., London, S W 15)

\*Uriodone Forte 'Brand Diodone Compound Solution —In excretion urography by intravenous injection, this gives superior shadows to diodone solution which are usually of adequate diagnostic quality without the use of compression — Does not cause the painful venospasm in the arm which often follows the injection of iodoxyl — Ampoules of 20 c c singly and in boxes of 5 (Pharmaceutical Specialities (May & Buker) Ltd. — Dagenham)

Vivomin. This product is a food supplement for motherhood, designed to supply in attractive form the additional requirements of minerals and vitamins of pregnant and nursing women over normal women's requirements, after allowing for the extra rations which pregnant women are allowed. The basis from which these requirements is calculated is that recommended by the National Heseurch Council of the USA, which is the most up to date Vivonin contains the materials shown below, together with cocea, malt extract, and sugar One tenspoonful provides the amounts of minerals and vitamins indicated— This product is a food supplement for motherhood, designed to supply in attractive

Ingredient	Supplying	Amount per Teaspoonful
(alcum phosphate B P	Calcium	0 34 g
e me min Europhane.	Phosphorus	0 175 g
terrous carbonate sacch BP	Iron	3 4 mg
Potassum rodule	Iodine	0 115 mg
Copper sulphate	Copper	0 84 mg
Manganese sulpinte	Manganese	084 mg
Yeast	Vitamin B <sub>1</sub>	0 84 mg
Riboflavin	Vitamin B <sub>1</sub> }	0 34 mg
Nicotinic mui	Nicotime acid	34 mg
Ascerbie neid	Vitamin C	340 mg

Dosage and direction. The daily amount recommended for pregnant women is one teaspoonful, and for nursing mathers two tenspoonfuls taken in hot or cold milk. The powder should be stirred to a cream with a little of the milk, and the remander of the mixture with stirring. (The Crookes Laboratories, London, NW10)

Whooping-Lough (Alum-Precipitated) Vaccine. Each cc contains H pertussis 20,000 million, and 0.01s pre cent mersalute. Specially designed for prophylaxis, giving a higher level of response with smaller total design than that required by ordinary suspended vaccines. Initial substitution of 0.5 cc., followed by a second dose of 1 c 2 to 3 weeks later. Alternatively, two doses of 0.5 cc. at two to three-week intervals. (Glaxo Laboratories Ltd. Greenford Maddle w x 1

## MEDICAL AND SURGICAL APPLIANCES

Answibetic Airway. The anaestheta airway, of which to-day there are so many patterns, has one outstanding fault in design, it cannot be taken apart for cleaning. Mr. Thompson, of the New Zealand Army, has drawn the attention of Messrs. Down Bros. to this feature, and they are now prepared to supply all types of anaesthetic airways made in such a fashion that they can be taken apart for cleaning in accordance with the design of Mr. C. E. England, of Wellington, New Zealand. The illustration on p. 57 shows Mona Roberts' Airway made in this fashion. (Rown Bros. Ltd., 22a, Cavendish Square, London, W.1.) (See illustrations, Adv. p. 57.)

Augerbit. An angerbit designed by Mr k. If Pridie, has been made in two sizes—one for cutting a new acctabulum in a case of a shallow hip-joint and the other for the arthrodesis of the knee and ankle. In arthrodesing the ankle the internal malleolus is first turned outwards and a half circle of bone is taken out of the upper part of the astrogalus and the lower part of the strength of the circle of the is removed right down to the fibula and the hole thus made is filled with bone chips taken from the middle of the ilium. In this way a simple, quick arthrodesis can be performed on an ankle without disturbing any important structures. A similar operation can be done on the knee. (Down Brox Ltd., 22a, Cavendish Square, London, W 1) (See illustration, that u. 54). tration, . Idet p. 54

Beard for Cutting Skin-grafts of Definite Width.—In The Lancet of December 16, 1944, Mr P. Gabarro, Plastic Surgeon at an EMS. Hospital, describes various ways in which skin-grafts are manipulated when being cut free-hand. He shows a new method, uthizing a standless steel "Graft Board" which he has designed. This appliance has measured notches on its four sides of 2, 2½, 3½, and 4 inches. It is pressed down on the donor area and enables a graft to be accurately cut to the required width (Chas F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London W.I.)

Clavicle Rings. - Mr. Whitchurch Howell has devised a ring splint for fractured clavacle. The advantages of this apparatus are: (1) Simplicity of application, (2) Absence of distress to the patient. (3) The arms are perfectly free—even a bicycle or horse may be ridden immediately after application. (4) The breathing is left enthely free and unrestricted. (5) There is no pressure on the chest, which is particularly desirable in women. A full description of this splint was published in The Lancel, September 16, and British Medical Journal, October 7, 1944 (Down Bros. Ltd., 22a Cavendish Square, London, W 1.) (See illustrations, Adot p 54.)

Diathermy Chp.—Mr Ralph Friedman, West End Hospital for Nervous Diseases, writes as follows, in the British Medical Journal, September 4, 1944 "Those who have to use a diathermy kinfe and suction apparatus have often been annoyed, or possibly angry, when at the critical moment neither was to be found at hand Inadvertently they have faillen from their precarious positions on to the floor and have become unsterile, precious minutes thus being lost in substituting new sterile apphances. After much thought have devised a very simple and inexpensive instrument which would end the unnecessary headaches that bothered us and help our brain operations to proceed smoothly and harmoniously. The apparatus is clipped on to the sterile sheet, the diathermy and glass sucker fit neatly into a spring clip at either end. My chief and I have tried this dual instrument-holding clip and have found it most useful and satisfactory Whenever the diathermy knife of suction apparatus was wanted, it was exactly where we had placed it. I have named this instrument Mr. Knight's diathermy and suction holder as a token of respect and esteem to my neuro-surgical chief. I hope that others, too, will find the same satisfaction in using it. Messrs Down Bros have been most helpful and have done their best to make the instrument as rust proof as it is possible." (Down Bros Ltd., 22a, Cavendish Square, London, W1.) (See illustration, Adv. p. 57.)

Gabriel's Rectal Dilator.—This is an improvement on the St. Mark's pattern dilator, devised by Mr W B Gabriel Made of thick glass which will withstand repeated sterilization. It is conical in shape, and the lower part which actually comes in contact with the anus is cylindrical. This ensures maximum dilatation and helps to retain the dilator in position. (Allen & Hanburys Ltd., Bethnal Green, London, E 2)

Gimson's Set of Infusion Needles —Designed by Dr. Janet Gimson, of the Children's Hospital, Great Ormond Street. This set of four different-sized needles was designed for injection into the bone-marrow of the tibia in infants. Supplied complete with cuffs for retaining the needles in position. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Gonometer for Measurement of Supination and Pronation —This instrument, designed by Mr James Patrick, Orthopædic Surgeon, Glasgow Royal Infirmary, provides a simple method of measuring supination and pronation movement of the forearm. It consists of an engraved scale with a rotating pointer, which enables the surgeon to read off the degree of movement. The method of using it is described in the British Medical Journal of August 19, 1944 (Chas F Thackray Ltd Park Street, Leeds, and 252 Regent Street, London, W 1)

Instrument for Manipulation of Central Middle-Third Fractures of Face,—Mr. Archibald II McIndoe describes in the British Medical Journal of January 1, 1944, a forceps with specially shaped jaws which he has designed. The jaws are shaped to the area of the alveolus to be gripped, and the forceps have been found of value in impacted central middle-third facial fractures with retro-position of the alveolar segment requiring forcible disimpaction (Chus F Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W I)

Insulin Syringe—Dr C T Andrews, Honorary Physician to the Royal Cornwall Infirmary, Truro, writes in the British Medical Journal, October 21, 1944. "An insulin syringe which has been made for me by Messrs Down Bros is intended chiefly for diabetics on a single or two equal does of insulin daily and who are liable to make mistakes in the measurement of their dose—for example, those with failing vision, early cerebrovascular degeneration, and senile patients who find it impossible to arrange for someone else to give them their injection of insulin The illustration on p 57 explains itself. The stop on the piston is adjustable to 5-unit intervals for ordinary-strength insulin and can easily be adjusted by the doctor. When the case is balanced and the dose of insulin determined, the patient is then handed the syringe suitably adjusted and instructed to fill it for each dose." (Down Bros. Ltd., 22a, Cavendish Square, London, W.1.) (See illustration, Idvt p 57.)

Midwifery Forceps —The necessity for obstetric forceps with specialized measurements for use in India, to correspond with the average anatomical measurements of the patients, which differ from European ones, is being increasingly recognized Lt.-Col F. R. W. K. Allen has recently devised such a forceps—In this instrument the blades, shanks, and locks are similar to those of the Bengal Forceps devised by the late Sir Kedarnath Das—The handles, however, are light as advocated by Neville, Haig Ferguson, and Porter Mathew. To this forceps axis traction appearatus of the Neville type (suitably lightened to conform with the rest of the instrument) has been attached (Down Bros Ltd, 22a, Cavendish Square, London, W.1.) (See illustration, Advt. p. 55)

Needle Holder.—Dr Wright Lambert writes in The Lancet, October 21, 1944, as follows "For neat and almost paniless suturing of small wounds, and for situations where it is difficult or impossible to use ordinary needles, I have for many years used a tubular needle, in which there is no eyelet to pull through the tissues. It was, however, difficult to thread and to hold, the ordinary needle holder or artery forceps either crushed or broke the needle. To overcome these disadvantages I have designed the Record syringe type of end piece for the needle and a holder to fit this, the illustration on p 57 is self-explanatory. The angle piece is detachable and can be supplied bent in any variety of angle to meet particular requirements. As a precaution against the needle becoming detached, which might be disastrous in such sites as the mouth, the bavonet type of fitting can be used. The needles are made in the usual curves and their calibre can be made specially to take all sizes of suture material, including non toxic stainless malleable steel wire. (Down Bros Ltd, 22a, Cavendish Square, London, W1) (See illustration, Advl. p 57)

Needle for Repair of Perincum.—Dr. J S Laurie, of Kinsley, writes in the Brutsh Medical Journal of September 9, 1944, that the majority of perincal tears are repaired efficiently without an anæsthetic He describes a curved hollow needle, which is passed through both edges of the tear, enabling the suture to be threaded through its lumen There is no excessive trauma, as a single thread is used in contra-distinction to the conventional double thread with an ordinary needle (Chas F Thackray Ltd , Park Street, Leeds, and 252, Regent Street, London, W.1)

Pencillin Spray — Brigadier R M B Mackenna, writes as follows in The Lancet, September 2, 1944 "The spray here depicted (see p 55) was devised by Messrs Down Bros Ltd at my request to fulfil the following requirements. It was to be well adapted for spraying the surface of the skin, made entirely of glass, except the cork, the bellows, and the bellows tube, and designed so that the operator could measure with reasonable accuracy the amount of fluid he was using. The spray was intended to ensure economy and control of penicillin solutions when used in the treatment of skin diseases by the technique which, in the Army, has been developed by Majors K E. A Hughes and P H Taylor. The spray is made on the usual principles, except that a small reservoir holding 0.1 ml of fluid is incorporated in the side of the main reservoir, and the suction stem of the apparatus fits into this. The reservoir is charged with fluid in the usual way —(a) in figure. Immediately before use the spray is tilted so as to allow the required amount of fluid is retained in the accessory reservoir (c), from which it is delivered by squeezing the rubber hulls some six or more times until the reservoir is empty. This is obviously not an instrument of precision, but it is, nevertheless, a useful device for clinical work Its design will probably be slightly modified from time to time in the light of experience, but the fundamental principle is likely to remain unaltered." (Down Bros Ltd., 22a, Cavendish Square, London, W 1) (See illustrations, .1dit p 55)

Pentothal Apparatus --Major D E Dunnill, R A M (, writes in the British Medical Journal, December 16, 1944, as follows "The preparation of a simple portable and completely self-contained apparatus for the giving of continuous pentothal aniesthesia seems to fill a gap in the aniesthetist's armainentarium, and the following notes and illustration describe one which has been evolved in the light of experience gained during three years of use. It consists of a case, size 15 × 6½ × 6 in, which contains a standard Army transfusion bottle for giving intravenous saline, positive pressure is applied with a bellows and measured on a mercury manometer, and the rate of flow through the drip feed is regulated by a screw clamp. The rubber tubing from the drip feed to the intravenous needle has interposed a two-way tap, the second arm of which takes a standard Record syringe, so that at any time the saline can be cut off and pentothal injected All that is necessary to maintain a steady flow of saline into the vein is an occasional glance at the manometer and drip feed, and a squeeze on the bellows when the pressure falls. Pentothal is injected as often as desired from the syringe, which contains the usual 5 per cent solution. The case is designed to fit the arm of an operating table, but can be used anywhere else, such as on a bedside table, and the whole apparatus is easily removed for sterilization. Since, however, the tubing from the two-way tap to the needle is detachable for boiling after each case, the rest of the apparatus remains sterile and can be used repeatedly " (Down Bros Ltd., 22a, Cavendish Square, London, W 1).

Peritoneal Filter—IDr Norman Flower, of Yeovil, has devised a peritoneal filter for use in conjunction with the standard Yankauer's tube, about which he writes as follows "The cylindrical portion of the filter corresponds in size to a 1½ in diameter Ferguson's speculum The distal and is closed and tupered The perforations are ½ in diameter and the handle is set at the most convenient angle for use The instrument was designed to simplify the evacuation of free fining from any part of the abdominal cavity The troublesome obstruction of the suction nozzle by bowel is avoided and any handling of the intestines becomes unnecessary In operation it has proved to be a simple and time-saving device." (Down Bros Ltd., 22a, Cavendish Square, London, W 1.) (See illustration, 1det p. 56.)

Plaster Cutter -Dr Norman Flower, of Yeovil, writes in The Lancet, October 14, 1944 "The instrument here illustrated (see p 54) is designed to facilitate the rapid removal of plaster splints by cutting through the plaster with a wire which has been laid in it at the time of application. The wire should exceed the length of the splint by about 6 in top and bottom. The upper end is bent over and held until required by a plain cotton bandage. The lower end is dealt with in a similar manner, but fixed with a few turns of plaster bandage to prevent pulling through. It is hardly necessary to add that if any pudding with wadding bandages or adhesive felt is used at the extremities of the splint, or elsewhere, for protection purposes, the wire must be 'laid' superical to this. The instrument consists of a wooden rod about 12 in long. One end of this is shaped to afford a good stabilizing grip for the left hand, to the other end a ratchet lever is attached, giving a powerful pull for the right hand. The rod is provided with a threading hole to take No. 16 gauge galvanized from wire, which appears to be adequate and does not rust. No excortation of the skin has been observed after the removal of skin that plasters by this method the east can be cut from end to end in a minute or less, including any additional theknesses there may be due to the fixation of the stirrup. Occasionally the end of the plaster becomes somewhat soggy; it is then advisable to cut down until firm plaster is reached, so avoiding dragging of the plaster bandage by the wire. The wire will never cut a plaster which is not quite dry? (Down Bros. Ltd., 22a, Cavendish Square, London, W 1) (See ulustration, Adut p 54)

Plastic Spheres for Implantation into Tenon's Capsule in the Frost-Lang Type Operation for Encolestics of the Eyeball.—An ophthalmic surgeon writes "It occurred to me some time ago that methyl methacrylate resin spheres perforated in 2 diameters at right angles, and fluted on the surface in a sort of basket work pattern, might be better than perforated glass beads and even easier to obtain. The resin spheres first used produced an unexpected and extensive non-inflammatory orderns of the lids and cheek. This undesirable reaction occurred on several successive occasions. Messrs Down Bros suggested that the tissue reaction might be due to using unsuitable plasticizer and offered to make up some spheres in material proved to be mert. The firm kindly supplied me with some 17-mm. spheres as illustrated on 57. These have been used on four occasions up to date, only trivial post-operative tissue reaction was noted. One patient seen a year after the implantation was made had a perfect socket with good movement of his double shell (re-form) prosthesis, without any history of intervening irritation." (Down Bros Ltd. 22a, Cavendish Square, London, W 1) (See illustrations, Adot p 57.)

Preumatic Surgical Motor —This is an improved pattern of Albee's motor it is more powerful, smaller, and lighter, and being cylindrical in shape it is more convenient in use. Can be operated from a cylinder of oxygen or compressed air. It is therefore independent of an electric supply, safe and portable. It is supplied with a chuck to hold single or twin saws, drills, reamers, and other tools (Allen & Hanburys Ltd , Bethnal Green, London, E 2)

Prostate Pouch Retractor —Mr Charles E Kindersley, Surgeon to the Royal United Hospital, Bath, writes as follows to the British Medical Journal, November 18, 1944 —The retractor illustrated (see p 56) has been made for me by Messrs Down Bros, its purpose being to retract the trigonal area and prostate pouch so that the pouch can be inspected after enucleation of the gland —The curves are adapted to those of the pelvic cavity, and I have found it extremely useful in making the final inspection of the cavity — (Down Bros Ltd, 22a, Cavendish Square, London, W 1) (See illustration, 1dvt p 56)

Punch for Shaping Head and Neck of Femur—In performing the operation for vitallium cup arthroplasty, it is very difficult to cut the head and neck accurately. The following punch which will cut the head and neck to a tube of the correct diameter has been devised by Mr K H Pridie After the hip has been dislocated and the head turned out, the punch is applied in the angle of the neck and hammered home in the base of the neck. This will cut away the osteophytes and shape the neck in one operation. There is a screw thread to enable the sunch to be removed (Down Bros Ltd., 22a, Cavendish Square, London, Will (See illustration, Adot p 54)

Saccharometer Tube —Dr J E Stanley Lec, Medical Superintendent, New Cross Hospital, Wolverhampton, writes as follows in the British Medical Journal, June 24, 1944 "An apparatus for the rapid estimation of sugar in urine by Fehling's method, using a modified Bink's birette, was described by Carwardine, but the graduations showing the amounts of urine and water to be added are not clearly indicated, with the result that inaccurate findings are obtained and the use of Fehling's method makes it extremely difficult to ascertain the exact end-point. In order to overcome these difficulties, an improved model has been devised and adapted for use with Gerrard's cyano cupric method, which depends upon the fact that the colourless double counted of potash and copper is capable of holding cuprous ovide in solution. If, therefore, Fehling's solution is titrated with a sugar solution in the presence of this cyanide, the blue colour fades gradually, no precipitate being thrown down. The colourless end-point is thus very sharp, and, as there is no tendency to re-oxidation, the process may be safely conducted in an open flask. The secharometer tube, which has a double scale (c on the left and sugar percentages on the right), is so graduated that the urine is diluted to 1 in 10, the formula being—

c c diluted urine used = percentage sugar in specimen

"No cork is accessary with the present apparatus, because the lumen of the nozzle has been adjusted to a convenient size, and an Erlenmeyer flask with a long holder has been chosen with a view to reducing the risk of accidents due to escape of the boiling solution " (Down Bros Ltd, 22a, Cavendish Square, London, W I ) (See illustrations, Advi p 55)

Sternal Puncture Needle —Squadron-Leader E M Darmady, R A F, writes in the British Medical Journal, February 24, 1945, as follows "Marrow puncture and infusions are now an accepted part of modern medicine The complexity of some of the needles used, and their unsuitability for both diagnostic and transfusion purposes, has led to a search for a more satisfactory design. The needle here described has proved suitable for both procedures, while being simple in construction. The length of the needle has been reduced to a minimum, to prevent obstruction of the patient's vision and mouth when introduced sternally, and the but has been made as small as practicable to prevent the needle becoming top heavy. The bore is of Record fitting and has been made for use with standard blood transfusion apparatus and equipment. The adjustable guard with slender wings, enables the needle to be inserted at whatever angle the operator desires, and prevents too deep an insertion. The needle may be hild firmly in the final position by a strip of adhesive plaster over the wings. A handle is provided to assist control and ease of introduction" (Down Bros Ltd., 22a, Cavendish Square, London, W 1) (See illustration, Adat p 56)

Suction Apparatus.—This is an improved suction apparatus comprising a three-cylinder pump driven by an electric motor. The motor and pump are enclosed in a wooden case and supplied complete with two large bottles with non-return valve. The pump and bottles are mounted on a trolley with ball-bearing castors for hospital use, and also as a portable model in two separate cases for transport. It is silent in use and produces ample negative and positive pressures for all surgical procedures. (Allen & Hanburys, Ltd., Bethnul Green, London, E 2)

MEDICAL ANNUAL 391 Books

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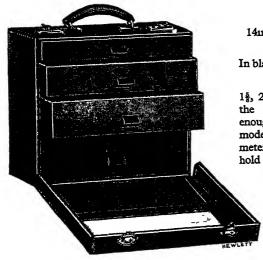
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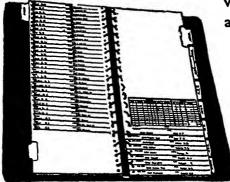
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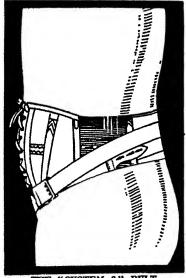
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Qualified Medical Practitioners and Registered Medical Students may enter on the practice of the Royal London Ophthalmic Hospital (Moorfields) at any time, and are on certain conditions eligible for appointment as Chief Clinical Assistant, Clinical Assistant, and Junior Assistant Courses of Instruction, extending over a period of five months, begin in October and March

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- 2 METHODS OF EXAMINATION AND USE OF THE OPETHALMOSCOPE
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# For Nervous and Mental Disorders

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FOR

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Telephone - Gatley 2231

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For particulars as to Lerms, etc., apply to:

G. W. T. H. FLEMING, M.R.C.S., L.R.C.P., D.P.M., Physician Superintendent (Telephone No. 6207 Gloucester),

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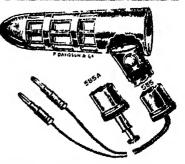
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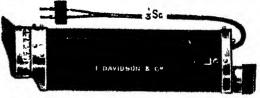
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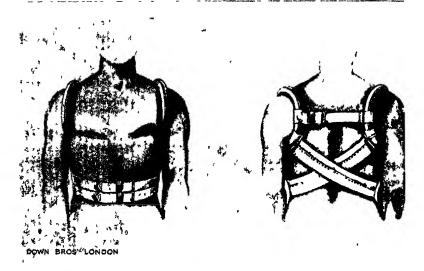
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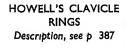
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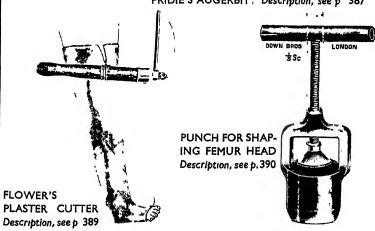
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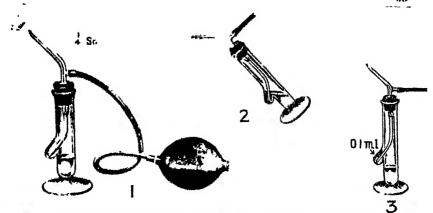


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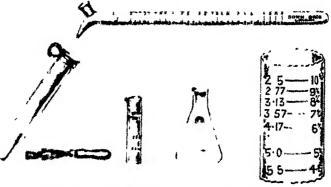
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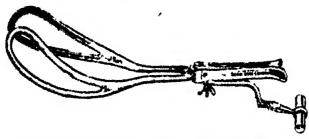
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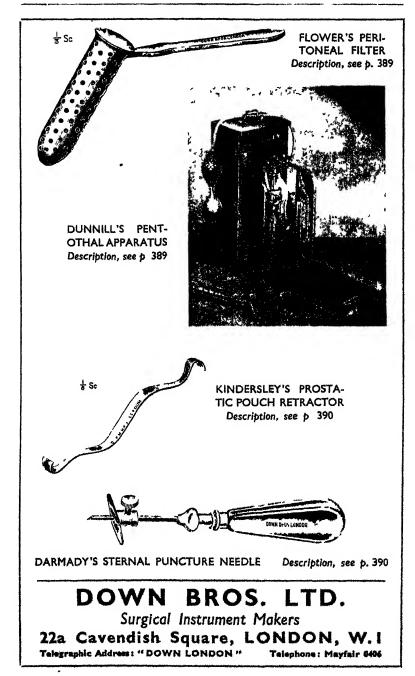
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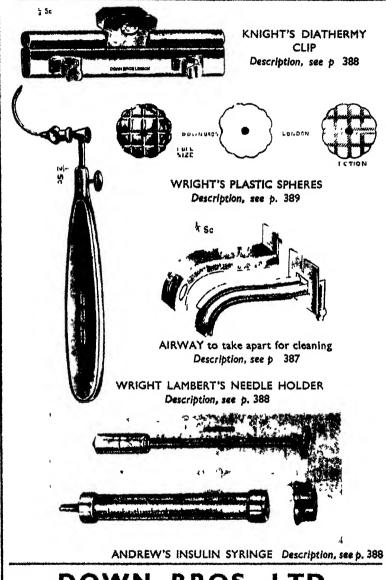
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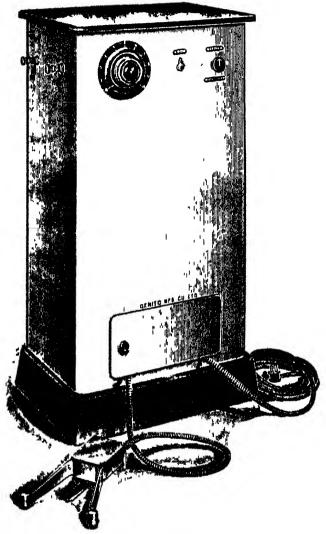
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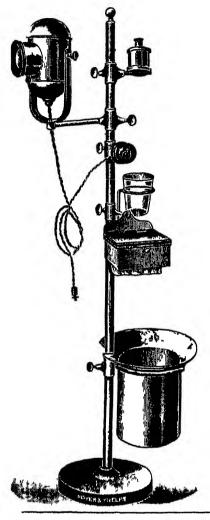
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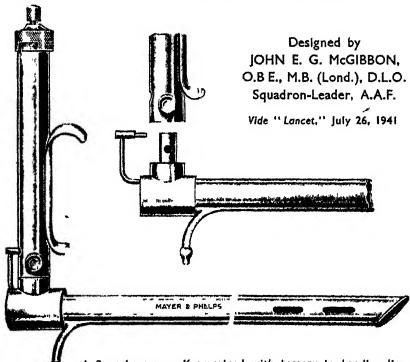
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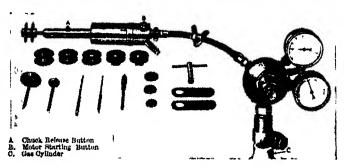


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1. Proceedings of The Royal Society of Medicine, Section of Otology, Vol. 22v, No. 12. Oct. 1942

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Apart from its inherent virtues as a rich source of natural vitamin C, now increasingly recognised, Ribena Blackcurrant Syrup has a marked degree of acceptability by patients in many categories.

The food forbles of the delicate child; the fickleness of palate of the pregnant woman are equally met by the palatability of Ribena. In more exacting cases e.g., patients with peptic ulcer, Ribena is tolerated in a measure that is pleasing to doctor and patient alike.

Ribena contains not less than 20 mg. ascorbic acid per fluid ounce together with the associated factors of the natural vitamin.

Under a Ministerial fuling Ribena is reserved for prescriptions, for invalids, for expectant and nursing mothers, and for children.

★ Blackcurrant syrup is recommended as a vitamin C supplement in the Ministries of Food and Health publication "Diets for patients with ulcers of the stomach and duodenum."



H. W. Carter & Co. Ltd., The Old Refinery, Bristol, 2

### MIO-MALT

(FERRIS)

Is a standardized preparation of tasteless Vitamins with Extract of Malt. It contains 6,000 units of Vitamin A and 1,000 units of Vitamin D per ounce, in combination with the finest Extract of Malt especially rich in Vitamin B, Albuminoids, Maltose, Natural Phosphates and Diastase.

MIO-MALT is pleasant to take. It does not produce diarrhora or other digestive troubles, and it may be given to the most delicate children and invalids; it is a perfect substitute in all cases where Cod Liver Oil and its preparations cannot be tolerated, and it may be taken even in large doses for long periods without any ill effects.

MIO-MALT is a valuable tonic food, both for infants and adults, in all cases of debility produced by lack of Vitamins, and it is specially indicated for use during the Winter months to compensate for the lack of sunshine, by building up the system and strengthening the bodily resistance to disease.

Dose.—One teaspoonful to one tablespoonful according to age, two or three times daily after food.

Supplied in 1 lb., 2 lb., 4 lb., and 7 lb. glass jars.

# **ELIXIR VI-GLANDIN**

(FERRIS)

A preparation of the thyroid gland, pituitary body, orchitic substance and ovarian tissue, in combination with animal and vegetable enzymes and the glycerophosphates of calcium, iron, sodium, potassium and magnesium.

Dose.—Half to two teaspoonfuls in water. Supplied in 2 oz., 4 oz., 8 oz., and 16 oz. bottles.

#### FERRIS & COMPANY Ltd.

Redcross Street, BRISTOL

Wholesale and Export Druggists and Manufacturing Chemists

OPIUM should always be prescribed in the form of

# NEPENTHE (Registered)

A PREPARATION derived entirely from Opum by a process which retains in the fullest degree the unrivalled sleep-producing and pain-allaying properties of the drug. The reputation of Nepenthe is based not on our

advertisements but on the experience of thousands of practitioners of successive generations.

Nepenthe is issued in 2, 4, 8 and 16 fluid oz. bottles. Dose: Five to Forty Minims.

Nepenthe comes within the provisions of the Dangerous Drugs Act.

#### ZYMALT (Ferris)

An active Liquid Preparation of the digestive enzymes of Malt. Dose: 1 to 4 drachms.

Supplied in ½ lb. and 1 lb. bottles.

#### ZYMALT HÆMATIC (Ferris)

A combination of Zymalt (Ferris) with Hæmoglobin, containing 2½ grains of Hæmoglobin in each fluid drachm.

Dose: 1 to 4 drachms.

Supplied in \$1b. and 1 lb. bottles.

#### ZYMALT HYPOPHOSPH (Ferris)

A combination of Zymalt with the Hypophosphites of Quinine, Iron, Calcium, Manganese, and Strychnine. (Contains 120 grain Strychnine in each half-ounce.)

Dose: 1 to 4 drachms.

Supplied in 1 lb. and 1 lb. bottles.

#### ZYMALT with CHEMICAL FOOD

Dose: 1 to 4 drachms. Supplied in 1 lb. and 1 lb. bottles.

# FERRIS & CO., LTD.,

WHOLESALE AND EXPORT DRUGGISTS.

Redcross Street, BRISTOL,

#### SYR. PECTÖRA LIS RUB.

(FERRIS)

#### A most elegant and efficacious LINCTUS

The active ingredients are Morphine, Chloroform, Hydrobromic Acid, Hydrocyanic Acid and Glycerin. The preparation is delicately coloured. Dose: 1 to 2 drachms.

Supplied in  $\frac{1}{2}$  lb.,  $\frac{1}{2}$  lb., and 1 lb. bottles.

#### UNG. SEDRESOL

Registered

(FERRIS) UNG. SEDRESOL is a combination of the products obtained by the destructive distillation of the wood and bark of the Betula Alba, in combination with Oxide of Zinc and Antiseptics. Supplied in \(\frac{1}{2}\) lb., \(\frac{1}{2}\) lb., \(2\) lb., and \(4\) lb. jars.

#### KEEDOSOL

(FERRIS)

The New and Safe Antiseptic A Powerful Germicide and Deodorant. Non-poisonous, Non-staining. Miscible with water in all proportions.

KEEDOSOL (Ferris) is a solution of the new antiseptic Parachlormetaxylenol in combination with various aromatic oils. It has a high Rideal-Walker value and is a most effective antiseptic. .

#### DIRECTIONS FOR USE.

For General Surgical Purposes, the Cleansing of Wounds, etc., and for use in Midwifery and Confinement Cases: Use a 1 to 2 per cent solution by adding 1 to 3 teaspoonfuls to a pint of water.

For Sterilizing Infected Linen and Utensils, etc.: Use a 5 per cent

solution by adding 2 tablespoonfuls to a pint of water.

KEEDOSOL is supplied to the Medical Profession in 4 oz., 8 oz., 16 oz., and 80 oz. bottles and I gallon tins.

# FERRIS & CO., LTD.,

WHOLESALE AND EXPORT DRUGGISTS, Redcross Street, BRISTOL.